TECHNICAL REPORT 043

Results and Data from an Ecological Study of Garry Oak (*Quercus garryana*) Ecosystems in Southwestern British Columbia

2008

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Ministry of Forests and Range
Forest Science Program

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Wayne R. Erickson

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ABSTRACT

This report and CD consist of excerpts from my MSc thesis from 1996, covering the context for the study, results and survey data. In the thesis, I sampled the plant communities associated with Garry oak (*Quercus garryana*) in British Columbia to develop a classification for use in resource management. An overview is included here of a total of 43 plant communities. Descriptions have also been placed on the Web (Erickson 1998) and, with some modification, are presented in a field guide (Erickson and Meidinger 2007).

A study of Garry oak ecosystems was compelling, given that they had been designated as critically imperiled in British Columbia. I used quantitative methods as well as subjective assessments to assemble a numerically adequate database, apply a landscape approach, and include wide geographic coverage. Although European phytosociology influenced some facets of my study, my classification is much more strongly related to other plant community research in the Pacific Northwest.

I therefore placed the classification in a scientific context through objective comparisons with the level of differentiation from other studies throughout the Pacific Northwest. The 43 plant communities identified and described in the thesis are placed in a setting of scientific work through subjective comparisons with the literature on similar plant communities.

Ecosystem relations of the plant communities are depicted from the collected field data, and supplemented with objective results at a broad level. Ecological hypotheses are suggested, along with management interpretations for each of the plant communities. In my thesis, preservation and active management are emphasized in a management strategy for Garry oak habitat as a whole.

ACKNOWLEDGEMENTS

In addition to those people credited in my thesis, I thank Del Meidinger for his editorial review, and Paul Nystedt and Rick Scharf for production assistance.

USE OF THE DATA FROM THE CD

The data included here (Appendices 1–10) is being released for public use. It is expected that people wishing to use the data will maintain scientific standards and duly acknowledge and cite the source and relevant interpretations. It is further suggested they contact the author for clarification or appropriate involvement in analysis and interpretation.

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c37a Oak – *Camassia quamash:* typic subcommunity **934-c37a.xls**
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c45 Oak – *Dicranum scoparium – Sedum spathulifolium* subcommunity **934-c45.xls**
c52 Oak – *Dicranum scoparium:* typic subcommunity **934-c52.xls**
c46 Oak – (Fd) – *Rhacomitrium canescens – Selaginella wallacei* subcommunity **934-c46.xls**

Other Native Plant Communities

c26 Oak – *Mahonia aquifolium* **934-c26.xls**
c16a Oak – *Lonicera hispidula* (colluvial) **934-c16a.xls**
c20 Oak – *Festuca idahoensis:* typic subcommunity **934-c20.xls**
c25 Oak – *Festuca idahoensis – Cerastium arvense* subcommunity **934-c25.xls**
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c47 Oak – *Elymus glaucus* **934-c47.xls**
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c43 Oak – *Bromus carinatus* **934-c43.xls**
c14 Oak – *Carex inops* **934-c14.xls**
c13 Oak – *Melica subulata* **934-c13.xls**
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c8 Oak – *Symphoricarpos albus – Rosa nutkana – Lonicera ciliosa* subcommunity (thickets) 934-c8.xls
c9 Oak – *Symphoricarpos albus – Rosa nutkana – Oemleria cerasiformis* subcommunity (thickets) 934-c9.xls
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Other Communities
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c23 Oak – *Bromus sterilis* 934-c23.xls
c31a Oak – *Anthoxanthum odoratum* 934-c31a.xls
c29a Oak – *Poa pratensis – Vicia sativa* 934-c29a.xls
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Ecological data were collected during a survey of the Garry oak (*Quercus garryana*) habitat in southwestern British Columbia from 1992 to 1994. These data from over 300 plots were then analyzed and used to develop classification, interpretations, and a management strategy for the Garry oak habitat in B.C. The full scope of this work is presented in Erickson (1996). This thesis is available on microfilm from the National Library, as well as from local universities and agencies. This report comprises excerpts from this thesis, which outline the context, results, and survey data from the study.

In 1993, the first Garry Oak Meadow colloquium was held (Hebda and Aitkens [editors] 1993) and the now-popular Garry Oak Ecosystems at Risk brochure (Erickson 1993) was released by B.C. Ministry of Environment, Lands and Parks. Since then, public interest in conservation and management of Garry oak habitat has grown, and the scientific community has undertaken more ecological work. Following the increasing national and provincial attention, and the focus provided by the First International Garry Oak Meadow Symposium, the Garry Oak Ecosystem Recovery Team was formed to compile all existing scientific information and promote further ecological studies that aid in recovery. This publication furthers these interests by making basic ecological data and results available. Literature about the ecology of Garry oak ecosystems, a description and interpretation of the Garry oak plant communities and ecosystems, and a management strategy for the Garry oak habitat are presented in my thesis and in the other publications cited in the bibliography.

Terms of Reference

This report presents an overview of a classification of Garry oak communities, and detail of the contributing data and related results, based on a three-year reconnaissance ecological survey within the Vancouver Island and Gulf Islands portions of the range of Garry oak in British Columbia (Figure 1). The U.S. range of Garry oak was also integrated (Figure 2).

The classification was formed using plant species data collected from over 300 Garry oak plots which sampled all but the most disturbed. An overview of the U.S. part of the range was obtained using literature and fieldwork, including data from 23 plots. All plots were selected to contain oaks; therefore I did not describe the meadow portion of the landscape, in which oaks are peripheral but visually prominent. Environmental site information was collected for descriptive purposes. Subjective sampling methods were used, which have their roots in European and western North American traditions. This work is not designed for statistical validity and therefore cannot be extrapolated inferentially to the total population. However, I do extend my results to the Garry oak habitat subjectively. Each plot description offers a "snapshot in time," founded on a single site visit.

Underlying the thesis work was the urgency for action on the Garry oak ecosystems. Their endangered status sharpened the need for classification as a basic step in better understanding and accommodating these ecosystems. Management strategies and interpretations are also developed in this thesis to help to maintain the ecological integrity of the Garry oak communities.

This section presents an overview of the terms of reference for the study. The following sections present the methodology, followed by results and a summary. The accompanying CD includes Appendices 1–10, a complete bibliography, and the survey data.

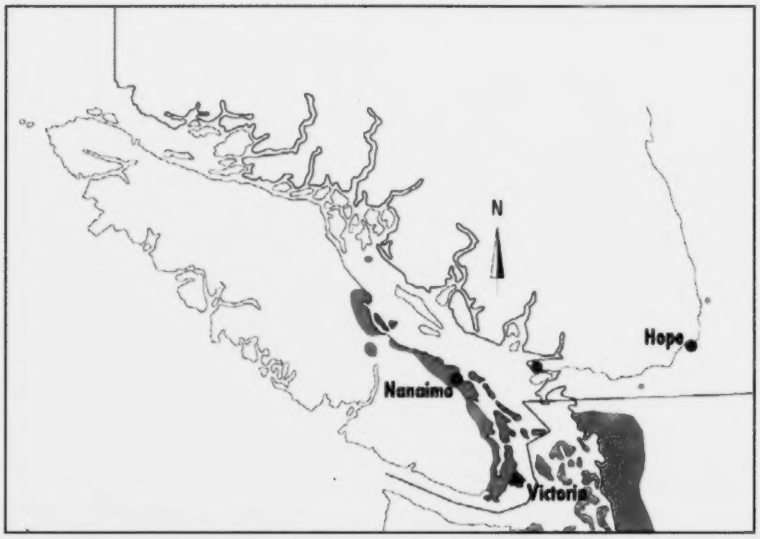


FIGURE 1 *Present distribution of Garry oak ecosystems in British Columbia and northern Washington.*

FIGURE 2 *Present distribution of Garry oak ecosystems in Canada and the United States.*

The Need for the Study

Garry oak communities are at risk in British Columbia (Erickson 1993). They have declined dramatically, and most of the remaining communities have been strongly modified. These ecosystems may be completely lost if determined conservation measures are not undertaken. Such loss would seriously threaten the biodiversity heritage of British Columbia. Ceska (pers. comm., 1992) estimated that about 140 of British Columbia's plant species (6% of the total vascular flora) are found only in these habitats (B.C. Conservation Data Centre 1995). Garry oak communities also sustain an impressively large proportion of the rare and potentially vulnerable plant taxa (red and blue lists) (A. Ceska, pers. comm., 1992), and the taxa that may become vulnerable in the near future (yellow list). About 75 red- and blue-listed plant taxa (about 12.5% of the total) and about 50 yellow-listed taxa (about 20% of the total) occur in Garry oak communities (A. Ceska, pers. comm., 1992).

The threats to Garry oak ecosystems accentuate the need for basic studies that can contribute to preservation and management. Garry oak ecosystems have not received a great deal of focus in the past, but growing awareness and deepening concern should support both scientific studies and public action. The full value of the Garry oak ecosystems will probably be realized in the future. Studies that now contribute to their preservation and management are therefore an investment in our future.

Serious management problems should be resolved if the remaining ecosystems are to be conserved. Solutions must be based, in part, on information from research studies. Though Roemer (1972) dealt with the Garry oak ecosystems substantially, research information remains limited. More information is required to understand the dynamics of the Garry oak landscape. The scope and accuracy of ecological evaluations and recommendations should increase with knowledge extrapolated from the U.S. part of its range. A classification of the British Columbia stands, based on more intensive sampling, will facilitate judicious application of this knowledge. Sampling programs in British Columbia have been preoccupied with "undisturbed climax conditions." However, many Garry oak communities are dominated by adventive species, and a comprehensive management approach should be based on understanding them. The fact that this classification focuses equally on these communities is one difference from most previous classification work.

Many management concerns are associated with Garry oak communities. The need for the following management criteria has guided this study:

- the floristic composition of the Garry oak ecosystems
- identification of communities that should be preserved if undisturbed stands are not available
- the adequacy of oak regeneration
- factors that may limit oak regeneration, such as the cover of annual grasses
- the possible role of prescribed burning
- the susceptibility of different sites to encroachment by Douglas fir (*Pseudotsuga menziesii*), native shrubs, or broom (*Cytisus scoparius*)
- maintenance of biodiversity in Garry oak communities.

Key Research Questions

The following key research questions were identified to address management concerns and other needs:

- What is the array of plant communities in the Garry oak stands of British Columbia?
- What classification framework can be developed for these plant communities?
- What can be suggested about how these plant communities are related to each other, to disturbance, and to major site features?
- What management interpretations are possible from the research information, and what strategy can envelop the interpretations?

Objectives of the Research

The key research questions formed the basis for three objectives:

- to gather and interpret information available on the vegetation and ecology of Garry oak ecosystems
- to sample and classify the array of current Garry oak communities in British Columbia at a reconnaissance level
- to interpret management options and implications, including strategies for maintaining and preserving ecosystem integrity and biodiversity

The objectives seek to deliver information essential to the management and conservation of Garry oak ecosystems, interpret this information for management, and present an overall strategy. A plant community classification offers a framework within which knowledge of ecosystem function and dynamics can be organized. It communicates elements of the Garry oak landscape to managers, scientists, and naturalists, and provides a common language in which to share knowledge. A classification establishes a reference point for comparing the results of treatments, and suggests hypotheses to investigate. Classification is fundamental to the completion of other needed pursuits, such as inventory and mapping.

METHODOLOGY

Overview of Methods

Two concepts from the literature characterize the general approach for the field study: "subjective sampling without preconceived (personal) bias" (Mueller-Dombois and Ellenberg 1974) and "successive approximation" (Poore 1962). Standard manuals or texts generally guide field and analytic methods (Mueller-Dombois and Ellenberg 1974; Canada Soil Survey Committee 1978; Walmsley et al. [editors] 1980; Luttmerding et al. [editors] 1990; Habitat Monitoring Committee 1990).

I chose a large geographic area—the main range of Garry oak in British Columbia—for study (Figure 1). Potential areas for the ecological survey were identified from ecological studies, soil reports, aerial photographs, and word-of-mouth accounts. Field reconnaissance, consisting of a series of walking surveys taking observations of species distributions, communities, and their apparent ecological relationships, was initiated in these potential areas. Com-

munities were noted when combinations of visually dominant plant species were repeated across the landscape.

This reconnaissance, along with predetermined criteria information, was used to select sites that represented the communities and site attributes. Of these site attributes, particular attention was given to ecological moisture regime class (Walmsley et al. [editors] 1980) at the selection stage. Sites were sampled as plots by describing vegetation, soils, environment, and oak characteristics. Each site was described in one of two time-interval classes: early season (early April to mid-May) and later season (mid-May to early July). These classes were then developed separately in the classification. Some plots were described for both time-interval classes and each description was used separately when it was possible to characterize both an early- and later-season community. I designated the plot standard as the "reconnaissance plot" level because of the relatively low quantity of data and reduced time available for completion, compared with ecological full plots work (e.g., completion of all fields in Walmsley et al. [editors] 1980).

The vegetation estimates were used to develop the plant community classification. Each plant community was formed by grouping plots in various combinations based on dominant species, comparison, rearrangement, and refinement. Environmental and other information was used for descriptions.

For this study, the concept of plant communities was simply accepted. A plant community is a "volume of relatively uniform vegetation" (Pojar et al. 1991) that repeats across the landscape in a similar combination. The plants in this combination are thought to depend on and modify their environment and influence one another (Mueller-Dombois and Ellenberg 1974). Together with their common habitat and associated organisms, they form an ecosystem (Mueller-Dombois and Ellenberg 1974). By classifying the early- and later-season time-intervals separately, I am allowing the possibility of one ecosystem having two plant communities at this scale (site-level).

Description of Methods

Plot Selection Sites for plots were selected subjectively using the following criteria:

- oak dominance (codominance, subdominance)
- understorey with native or naturalized species
- species indicating magnitude of disturbance (e.g., ivy, blackberry) of lesser cover
- homogeneity
- areal extent: judged to meet minimal area requirements (70–300 m^2)
- representativeness of the site (environmental) and Garry oak stand
- understorey characteristics
- sampling needs assessment: replication versus geographic representation.

The sampling needs assessment was done on site to reconcile (1) representing a particular plant community for each geographic locale with (2) amassing the replicates required for the community in the whole study. A summary of plot size and configuration follows.

TABLE 1 *Summary of the most frequent plot sizes and shapes*

Square/rectangular: 112 plots, 44.8% of applicable total					
20 × 20 m	15 × 15 m	10 × 20 m	10 × 15 m	15 × 20 m	10 ×10 m
20 plots	19 plots	14 plots	14 plots	13 plots	10 plots
Squarish but slightly rounded and rounded: 37 plots, 14.8% of applicable total					
10 × 15 m	10 × 10 m				
7 plots	6 plots				
Circular: 24 plots, 9.6% of the applicable total					
15-m diameter					
9 plots					
Other (variable shapes and sizes): 77 plots					

Plot Method The plot work was completed at the "reconnaissance plot" level to meet the objective of sampling the wide array of Garry oak communities across their main distribution in British Columbia. Subjective selection of sites was used to meet this objective. All field-level designations of communities remained tentative and open to review and change, consistent with Poore's (1962) strategy of "successive approximation."

Several measures ensured the rapid completion of the plot work and plot samples which are numerically adequate to characterize plant communities. Class estimates of canopy cover provided an efficient field measure of vegetation dominance. Diameter measurements furnished a quick index of the general size and age class of the oaks. Investigation of soils was restricted to surface horizons.

Most sites were sampled in a single visit. The time of sampling corresponded generally to "peak vegetation development," occurring between April 21 and June 30, with some flexibility for late-season sampling. My sampling objectives had a desired level of 10 different plots per field-level plant community (Kuchler 1988) and a minimum level of three plots. Certain sites were revisited at intervals through the growing season to contribute to the seasonal characterization of the plant communities.

Forms and Vegetation Data Descriptive entries were recorded on B.C. Ministry of Forests ecological reconnaissance plot forms. Plots were photographed. Vascular plants were listed and their canopy cover—the "percentage of the ground included in a vertical projection of imaginary polygons drawn about the total natural spread of the foliage" (Daubenmire 1959)—estimated by classes (Table 2). Ground layer cryptogams were listed when they met the minimum of class 2 cover. Most species were identified in the field using information from previous floras and ecological studies (e.g., Hitchcock et al. 1969; Roemer 1972; Szczawinski and Harrison 1973). Unknown species were collected for later identification. Periodically, voucher specimens were taken to be placed in appropriate herbaria. Taxonomy used for species designations followed either Hitchcock et al. (1969) or Taylor and McBride (1977). Final designations were cross-referenced with Douglas et al. (editors, 1989, 1990a, 1990b, 1994), which have been accepted as the standard for ecological fieldwork in British Columbia (D. Meidinger, pers. comm., 1996). These equivalents are shown in Appendix 4.

Comparison charts for canopy cover estimates (Walmsley et al. [editors] 1980) served for standardization and calibration. An informal chart assisted

the estimates by converting the quantity of small plants to proportion of cover. Where necessary, plots were divided visually into tenths for estimating the more difficult covers. A 6-class cover scale was used. The mid-points were coded for use in data summaries in developing the classification.

TABLE 2 *Cover class scale*

Cover class	Mid-point (%)
1 0–1%	0.5
2 2–10%	6
3 11–25%	18
4 26–50%	38
5 51–75%	63
6 76–100%	88

Environmental Data and Other Information The major categories recorded on the reconnaissance plot sheets were: percent slope, aspect, elevation, slope position, surface shape, exposure, surface substrate, ecological moisture regime, surface soil characteristics, and humus form. Field methods and categories were based on those outlined in Canada Soil Survey Committee (1978) and Walmsley et al. (editors, 1980). Ecological moisture regime is a subjectively assessed expression of the moisture environment of a given site relative to other sites. In this assessment an established scale is used to depict conditions ranging from very dry (very xeric) to very wet (hydric). The "permesic" class was added between mesic and subhygric, and intergrades between the other classes were assigned as appropriate. Because of my emphasis on surface soils, soil survey reports were the main source of information about subsoils. Humus form depiction used the basic taxonomy from Klinka et al. (1981). Diameters of typical oaks and other trees were measured. The hardwood form-classes of Bolsinger (1988) were tested, applied, and refined (Erickson and Campbell 2001). This information provided input for the oak form-complexity rating used in the wildlife habitat and aesthetic/recreational interpretations. Wildlife and wildlife habitat attributes were recorded.

Classification As in the British Plant Communities project (Rodwell [editor] 1991), a taxonomic framework was not adopted from the literature. Instead plant community was used as a simple, generic term, with subcommunities assigned as appropriate. Internal rules for presence and cover requirements were developed and used consistently. The process of classification started in the field, with a visual review of each vegetation set and the subjective organization of each identifiable grouping into a field-level plant community element. Elements with repeated and consistent occurrence were assigned and listed as plant communities. This list was both developed and numbered sequentially, and I retained these original numerical designations to allow an abbreviated reference to the plant communities. I took the names of previously identified vegetation units into the field as possible communities. The subjective field process formed the basis for further sampling and for the first computer-assisted groupings for 1993 and was carried on for the 1994 field and office seasons.

The tabular comparison method (Mueller-Dombois and Ellenberg 1974) provided a general background for the subjective classification work. This

method works with a two-way table of species by plots, sorting them through successive plot placements into a completed synthesis table. The tabular process allows recognition of important trends in species distribution between the sample stands, isolates groups of species among the stands, and places those stands with similar species composition side-by-side in the table (Mueller-Dombois and Ellenberg 1974). The method is thought to reveal ways of solving problems of separating vegetation into units, and uncover information not realized during the fieldwork (Mueller-Dombois and Ellenberg 1974). My analysis suggested the addition of some new communities and discouraged maintaining several others.

I used both presence and cover in the process, but emphasized cover. My use of the EXCEL (Microsoft EXCEL 4.0) software greatly reduced the tedious and time-consuming aspects of traditional "hand-work."

Each potential plant community was assembled and then evaluated with various optional plot compositions. The primary rules were consistency in presence (constancy) and substantial cover of the species defining the type, combined with lesser mean values for the species defining other types. Minimum criteria were a mean presence of 0.70 or more (usually 1.0) in the potential community and minimum cover of cover Class 3 (≥ 11%) for each plot therein. The presence value of ≥ 0.70 means that the species would be present in at least 7 out of 10 plots in a group. Logical exceptions were allowed and these are shown in the results, particularly the key to the plant communities. I used the lower standard of ≥ 0.67 for those groups with only three plots. Higher minimum cover levels, equal to cover Class 4 (≥ 26%), were used for some shrub types. Many alternate placements were tried, as well as the combination and separation of groupings, in finalizing and defining the plant communities. When more than one placement of a plot was possible, I placed it in a potential native plant community (named for native or indigenous species), rather than in an introduced plant community (named for introduced or non-native species, later called first- or second-order disturbance communities). Within these categories decisions still had to be made on placement, and these are outlined in the order of classification and structure of the key to the plant communities found in the next chapter. Plots were grouped into either an early-season classification or a later-season classification, or both. When grouped into both, the sites will have two classified plant communities, for plot descriptions were either used twice or a revisit was made to the site. The time-interval distinction is carried forward into the key to the plant communities.

I assigned the term "plant community" for the basic units and added plant "subcommunity" (Rodwell [editor] 1991) within these where considered necessary on subjective grounds or based on adjusted Motyka comparison values greater than about 1.0. Subcommunities were delineated for additional plant species different from the named species of the original plant community, which was retained as the "typic" subcommunity. I have kept the terms "plant community" and "community" when referring to these units (communities and subcommunities) in general.

In addition to the subjective process described above, the thesis work used two objective tests aid in assessing and calibrating the groupings and supporting the classification through comparison and refinement. These were a "constant cover value index" and my adjustment of the Motyka coefficient of similarity (Mueller-Dombois and Ellenberg 1974). They were not intended to determine the level of classification, but rather to make suggestions for

subjective consideration. Later, multivariate analysis (Detrended Correspondence Analysis) was applied for similar purposes.[1]

Constant Cover Value Index The Constant Cover Value Index is a method I developed to review the success of the subjective grouping process in accounting for a major proportion of the total cover of each group. It can be seen as a refinement of the denominator from the Motyka index of similarity (Mueller-Dombois and Ellenberg 1974) applied to the "within" comparison (rather than the "between" comparison). For each plant community the cover was totalled for each of the constant species, those with a presence of ≥ 0.70 (≥ 0.67 for those with three plots). This numerator was then divided by the total cover for all species in the community to give the index value. In general, the higher the value, the "better" the grouping. Oak and other tree species were not included.

Adjusted Motyka Coefficient The Motyka index of similarity (Mueller-Dombois and Ellenberg 1974) is an index for stand or community comparisons using cover as the numeric value. I adjusted this index to compare differences and similarities between the plant communities within my classification. This level of differentiation was also compared with the level from selected pairs of plant communities within other classifications. The adjusted Motyka coefficient was modified to match my classification criteria and approximate my cover classes. Shrub, herb, and moss (B, C, and D layers) species with a mean presence of ≥ 0.7 (≥ 0.67 for those with three plots) were included. Tree species were not part of the index. The adjusted Motyka coefficient is a ratio between the similarities and the differences of the two communities, which can be expressed as: 2 × the sum of the similarities between A and B, divided by the sum of the differences between A and B: 2Mw/MA + MB.

The adjusted numerator (2Mw) represents similarities between the two community pairs. It is identical to the Motyka numerator except that the species had to be constant, meeting the mean presence requirement above. The lowest cover value of the two becomes part of the numerator when both communities share species. In my method, species cover differences become part of the denominator when the following criteria were met: a difference of 5% when one of the values was less than 10%; 10% when both values were greater than 10%; a difference of a cover class and 15% when both values were greater than 25%. Cover values of species form the second element in the denominator when the constancy requirement is met for one community and not for the other. Thus, my denominator quantifies the cover differences between the two communities, rather than the total cover used by the Motyka denominator.

Communities with perceived similarities were compared based on my field observations, their relative position on the ecological moisture regime scale, and the ordering of species in the vegetation table. I tested the plant communities from other studies against each other to determine the level of differentiation applied. These tests provided reference points for comparison with my study. It was necessary to use a lower presence requirement (≥ 0.61 [Class 4]) when that was the only level available approximating mine. These comparisons were developed from three other data sources, representing oak, savannah, and grassland communities from the Pacific Northwest, the larger

1 Erickson, W.R. 2002. Vegetation relationships in a classification of native Garry oak (*Quercus garryana*) communities in British Columbia. Presentation to Northwest Scientific Association 75th annual meeting program, March 27–30, 2002, Boise, Idaho.

geographic context for my study. The types in these data sources have physiognomy the most similar to that of Garry oak vegetation.

Multiple Regression Exploratory multiple regression analyses were conducted on the 1993 data using SPSS for WINDOWS (Version 6.0). The relationships between a plant community gradient (dependent variable) and environmental variables (independent variables) were examined, together and separately. The plant community gradient was developed by numbering plant communities from 1 to 32 for their position in an ordered table, correcting for their relationships and their placement in disturbance sequences. Such a numbering procedure is similar to the starting point in some forms of vegetation ordination (Beals 1973). Numeric scales were applied to seven environmental variables: percent surface rocks, surface shape, aspect, elevation, percent surface bedrock and/or shallow humus over bedrock; percent slope, and ecological moisture regime class. The adjusted R-square value and its derivative, percentage of variance accounted for, are the primary interpretation statistics for multiple regression. A relatively high subject-to-variable ratio (18:1) was maintained to preserve statistical reliability by minimizing shrinkage in the adjusted R-square values. Statistically, the sample domain was restricted to the confines of the plots actually sampled.

A general multiple regression assessed the ability of all predictors together to account for variation in the plant community gradient and determined which predictors were the most important, with all the others taken into account. A Pearson Product Moment correlation examined the individual relationships between and among the predictors and the plant community gradient. This correlation was also a check for collinearity or cross-relationships between the predictors. A stepwise multiple regression entered each of the predictor variables separately in decreasing order of the amount of variation they accounted for, with all the others taken into account. I also examined ecological moisture regime class separately as a dependent variable, with a general multiple regression using the six other environmental variables.

RESULTS

General Results

Three hundred and forty (340) plot descriptions were completed, consisting of 135 in 1994; 152 in 1993; and 53 in 1992. Most of the main range of Garry oak in British Columbia was covered in the 125 geographic areas sampled for plots (Figure 3, Appendix 2). The 1992 plots were treated as general reconnaissance, as I felt I had obtained an adequate number of samples for the tabular analysis in the two following years. However, the 1992 plots in British Columbia were classified (see Appendix 3). The following text gives an overview and specifics of results for plant communities, the analyses which influenced their classification, and regeneration of oak. Other results and the data collected are found on the attached CD.

Overview of the Plant Communities

Forty-three (43) plant communities (Table 3) are recognized and characterized. They are described in detail with their ecosystems in Chapters 5 and 6 of the thesis. A key to the plant communities follows. They are grouped into six categories, used as a basic sequence for organization. This sequence does not represent a classification. The terms "first-order" and "second-order"

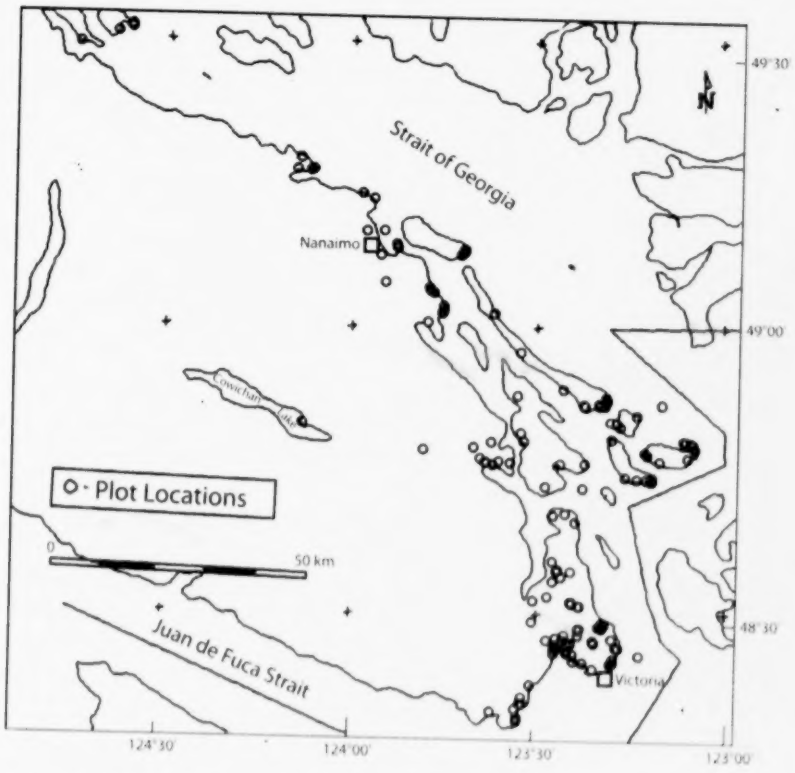


FIGURE 3 *Plot location areas. Each circle represents 1–10 plots.*

disturbance communities reflect the apparent sequence of vegetation change and site disturbance following the introduction of non-indigenous species by European colonists. Alpha-numeric designations for the plant communities allow a cross-reference mechanism to my sequential data files and a short form for representing the communities.

The six consolidated categories reflect the diversity in the Garry oak communities. Three native and three non-native divisions are recognized. Of the native groupings, seven early-season plant communities (with early peak vegetation cover growth between April 1 and May 15), four native plant communities of rock outcrops, and 15 other native plant communities encompass the rest of the sequence of moisture conditions. The non-native plant communities roughly parallel this pattern and are divided into two portions according to the timing and degree of disturbance leading to their composition. A "first-order disturbance" group does not have Scotch broom (*Cytisus scoparius*) dominance and has nine plant communities. A "second-order disturbance" group has Scotch broom dominance, consisting of three rock-outcrop communities and five others from less-severe moisture condition sites.

Ten communities had at least 10 plots, meeting the desired sampling objective. Twenty-three communities had between five and nine plots; and 10 communities had three or four plots, meeting the "minimum" sampling requirement of three plots. The latter were generally either detected late in the sampling or occurred infrequently.

Instead of adopting a taxonomic classification framework, I assigned the term "plant community" for the basic units. Physiognomic, site, or other features are included in community names, where particularly striking.

Plant "subcommunity" was added where considered necessary on subjective grounds or because of the adjusted Motyka comparison results. Subcommunities were delineated for additional plant species different from those the community was originally named for, which was retained as the "typic" subcomunity. The typic subcommunity is therefore defined by the lack of the named species from other subcommunities. This use of the term follows both the United States and Canadian (subgroups within the Organic Order) systems of soil classification (Soil Survey Staff 1975; Canada Soil Survey Committee 1978). I have retained the term "plant community" for referring to these units (communities and subcommunities) in general.

More plant community diversity was encountered than the 15–30 types anticipated. There was a wider series of native plant communities, and a fairly full sequence of two types of disturbance communities. The variation in climatic conditions and vegetation history across the region covered by the study may control some of this diversity.

The communities are presented in the following landscape diagrams, charts of their distribution and moisure regimes, and suggestions for their origins and derivations from successional history (Figures 4–22).

TABLE 3 *List of consolidated groupings of plant communities*

Code	Description
Early season plant communities	
c37a	Oak—*Camassia quamash*: typic subcommunity
c35a	Oak—*Camassia quamash – Erythronium oregonum* subcommunity
c35b	Oak—*Camassia quamash – Dodecatheon hendersonii* subcommunity
c37b	Oak—*Camassia quamash – Ranunculus occidentalis* subcommunity
c36	Oak —*Camassia leichtlinii*
c48	Oak—*Montia perfoliata*
c51	Oak—*Dicranum scoparium – Plectritus congesta* subcommunity (also below)
Native plant communities of bedrock outcrops	
c51	Oak—*Dicranum scoparium – Plectritus congesta* subcommunity (early season) (also above)
c11	Oak—*Dicranum scoparium – Montia parvifolia* subcommunity
c45	Oak—*Dicranum scoparium – Sedum spathulifolium* subcommunity
c52	Oak—*Dicranum scoparium*: typic subcommunity
c46	Oak—(Fd) – *Rhacomitrium canescens – Selaginella wallacei* subcommunity
Other native plant communities (dry to wet)	
c26	Oak—*Mahonia aquifolium*
c16a	Oak—*Lonicera hispidula* (colluvial)
c20	Oak—*Festuca idahoensis:* typic subcommunity
c25	Oak—*Festuca idahoensis—Cerastium arvense* subcommunity
c27	Oak —*Festuca idahoensis—Trifolium microcephalum* subcommunity
c42	Krummholz Oak—*Festuca idahoensis—Vicia americana* subcommunity (sea-edge)
c47	Oak—*Elymus glaucus*

TABLE 3 *Continued*

Code	Description
c41	Oak—*Lathyrus nevadensis*
c43	Oak—*Bromus carinatus*
c14	Oak—*Carex inops*
c13	Oak—*Melica subulata*
c15	Oak—*Holodiscus discolor—Symphoricarpos albus—Polypodium glycyrrhiza*
c10	Oak—(Fd)—*Holodiscus discolor—Symphoricarpos albus—Rhytidiadelphus triquetris*
c8	Oak—*Symphoricarpos albus—Rosa nutkana—Lonicera ciliosa* subcommunity (thickets)
c9	Oak —*Symphoricarpos albus—Rosa nutkana—Oemleria cerasiformis* subcommunity (thickets)
	First-order disturbance plant communities (dry to wet)
c50	Oak—*Rhacomitrium canescens—Festuca bromoides* subcommunity
c21	Oak—*Cynosurus echinatus* (late season)
c23	Oak—*Bromus sterilis*
c31a	Oak—*Anthoxanthum odoratum*
c29a	Oak—*Poa pratensis—Vicia sativa*
c28a	Oak—*Dactylis glomerata:* typic subcommunity
c28b	Oa—*Dactylis glomerata—Bromus carinatus* subcommunity
c30	Oak—*Dactylis glomerata—Arrhenatherum elatius* subcommunity
c49	Oak—*Dactylis glomerata—Agrostis stolonifera* subcommunity
	Second-order disturbance plant communities (broom series)
	Bedrock outcrops:
c3	Oak—Broom—*Rhacomitrium canescens—Festuca bromoides—Aira* subcommunity
c17	Oak—Broom—*Rhacomitrium canescens:* typic subcommunity
c22	Oak—Broom—*Rhacomitrium canescens—Bromus tectorum* subcommunity
	Other second-order disturbance communities (broom series) (dry to wet)
c2	Oak—Broom—*Cynosurus echinatus* (late season)
c31b	Oak—Broom—*Anthoxanthum odoratum*
c6	Oak—Broom—*Elymus glaucus*
c4	Oak—Broom—*Poa pratensis*
c5	Oak—Broom—*Dactylis glomerata*

Synopsis of Key (to depict structure of facultative key)

A. Early-season classification[2]

1. *Camassia quamash* usually dominant:

CHOOSE THE FIRST OF THE 4 SUBCOMMUNITIES WHICH FITS

2. CHOOSE THE FIRST OF THE 3 REMAINING COMMUNITIES WHICH FITS

2 Stands are to be keyed in the early season section between April 1 and May 15 or when plant phenology allows. Once keyed to an early season plant community, a site may also be keyed to a later season classification and have two identified plant communities.

B. Later season classification

1. Mostly native dominant species

1a. Bedrock landscapes

1a1. *Rhacomitrium canescens* dominant

CHOOSE THE FIRST OF THE 4 SUBCOMMUNITIES WHICH FITS

1a2. *Dicranum scoparium* dominant

CHOOSE THE FIRST OF THE 4 SUBCOMMUNITIES WHICH FITS

1b. Dominated by dense cover of native shrubs

1b1. *Rosa nutkana* constant cover

CHOOSE THE FIRST OF THE 2 SUBCOMMUNITIES WHICH FITS

1b2. *Rosa nutkana* not constant cover

CHOOSE THE FIRST OF THE 2 REMAINING COMMUNITIES WHICH FITS

1c. Dominated by native herbaceous vegetation

1c1. *Festuca idahoensis* constant cover

CHOOSE THE FIRST OF THE 4 SUBCOMMUNITIES WHICH FITS

1c2. *Festuca idahoensis* not constant cover

CHOOSE THE FIRST OF THE 5 REMAINING COMMUNITIES WHICH FITS

1d. Previous criteria not met, dry colluvial sites, native shrubs

CHOOSE THE FIRST OF THE 2 COMMUNITIES WHICH FITS

2. Mostly introduced dominant species broom absent or

2a. *Dactylis glomerata* constant dominant

CHOOSE THE FIRST OF THE 4 SUBCOMMUNITIES WHICH FITS

2b. *Dactylis glomerata* not constant dominant

CHOOSE THE FIRST OF THE 4 REMAINING COMMUNITIES WHICH FITS

3. Broom dominant

3a. Bedrock-dominated landscape

3a1. *Rhacomitrium canescens* constant dominant

CHOOSE THE FIRST OF THE 4 SUBCOMMUNITIES WHICH FITS

3b. Other broom sites, dominated primarily by herbaceous species

3b1. CHOOSE THE FIRST OF THE 3 COMMUNITIES WHICH FITS

3b2. CHOOSE THE FIRST OF THE 3 *DACTYLIS GLOMERATA* SUBCOMMUNITIES WHICH FITS

3b3. CHOOSE THE FIRST OF THE 2 REMAINING COMMUNITIES WHICH FITS

C. Repeat key if community not found, document as an unrecoginized community if no fit is found in this key.

Facultative Key to Garry Oak Plant Communities This key is primarily to be applied where Garry oak (*Quercus garryana*) is dominant in at least one layer; secondarily where it is co-dominant or subdominant. The reference to "other species" in the key alludes only to those in this key. Percent cover values are given here for convenience only. The cover classes outlined in Methodology and used in the plant community chapters (Erickson 1996, Chapters 5 & 6) are recommended for use. Stands of vegetation are to be classified into one or both of the two time interval classes shown ahead.

A. Early-season classification, April 1 to May 15; early-season plant communities defined by herbaceous vegetation, especially bulb-forming species; broom present or absent[3]**; if not, see B.**

A1a. *Camassia quamash* usually dominant: (if not, see **A1b.**)

A1a1. *Erythronium oreganum* usually ≥ 11% cover, *Camassia quamash* usually ≥ 11% cover: **c35a** Oak—*Camassia quamash—Erythronium oreganum* subcommunity (if not, see **A1a2**)

A1a2. *Dodecatheon hendersonii* ≥ 11% cover, Camassia quamash usually ≥ 11% cover: **c35b** Oak—*Camassia quamash—Dodecatheon hendersonii* subcommunity (if not, see **A1a3**)

A1a3. *Ranunculus occidentalis* ≥ 11% cover, *Camassia quamash* usually ≥ 11% cover: **c37b** Oak—*Camassia quamash Ranunculus occidentalis* subcommunity (if not, see **A1a4**)

A1a4. previous three sets of criteria not met, *Camassia quamash* usually ≥ 11% cover: **c37a** Oak—*Camassia quamash*: Typic subcommunity (if not, go to **C**)

3 Stands are to be keyed in the early season section between April 1 and May 15 or when plant phenology allows. Once keyed to an early season plant community, a site may also be keyed to a later season classification and have two identified plant communities.

A1b. *Plectritis congesta* ≥ 11% cover, *Dicranum scoparium* usually ≥ 11% cover, bedrock landscapes: **c51** Oak—*Dicranum scoparium*—*Plectritis congesta* subcommunity (if not, see **A1c**) (also in the key below)

A1c. *Montia perfoliata* ≥ 11% cover: **c48** Oak—*Montia perfoliata* (if not, see **A1d**)

A1d. *Camassia leichtlinii* ≥ 11% cover: **c36** Oak—*Camassia leichtlinii* (if not, see **B**)

B. Later season classification (generally after May 15); continue in the key to add classification where not determined in previous step[4]; (if not, go to C)

B1. Mostly native dominant species, broom absent or of secondary importance ≤ 11 to 15% cover (low Cover Class 3): (if not, go to **B2**.)

B1a. Bedrock landscapes, units defined by combinations of mosses and herbaceous vegetation: (if not, go to **B1b**)

B1a1. *Rhacomitrium canescens* usually dominant, south- and west-facing slopes: (if not, go to **B1a2**)

B1a1a. *Selaginella wallacei* and/or *Rhacomitrium canescens* ≥ 11% cover, the other of which > 2% cover: **c46** Oak—*Rhacomitrium canescens*—*Selaginella wallacei* subcommunity (if not, go to **B1a1b**)

B1a1b. *Festuca bromoides* and/or *Rhacomitrium canescens* ≥ 11% cover, the other of which > 2% cover: **c50** Oak—*Rhacomitrium canescens*—*Festuca bromoides* subcommunity (if not, go to **B1a1c**)

B1a1c. *Bromus tectorum* ≥ 11% cover, *Rhacomitrium canescens* usually ≥ 11% cover (often > 51%): **c22** Oak—Broom—*Rhacomitrium canescens*—*Bromus tectorum* subcommunity (if not, go to **B1a1d**) (also in the key below)

B1a1d. previous three sets of criteria not met, *Rhacomitrium canescens* ≥ 26% cover, > other species: **c17** Oak—Broom—*Rhacomitrium canescens*: Typic subcommunity (if not, go to **C**) (also in the key below)

4 Stands are generally to be keyed in the later season section after May 15, or when plant phenology allows. Once keyed to a later season plant community, a site may also be keyed to an early season classification and have two identified plant communities.

B1a2. *Dicranum scoparium* usually dominant, usually north- and east-facing slopes (if not, go to **B1b**)

B1a2a. *Montia parvifolia* ≥ 11% cover, *Dicranum scoparium* usually ≥ 11% cover: **c11** Oak—*Dicranum scoparium—Montia parvifolia* subcommunity (if not, go to **B1a2b**)

B1a2b. *Plectritis congesta* ≥ 11% cover, *Dicranum scoparium* usually ≥ 11% cover: **c51** Oak—*Dicranum scoparium—Plectritis congesta* subcommunity (if not, see **B1a2c**) (also in the key below)

B1a2c. *Sedum spathifolium* ≥ 11% cover, *Dicranum scoparium* usually ≥ 11% cover: **c45** Oak—*Dicranum scoparium—Sedum spathulifolium* subcommunity (if not, see **B1a2d**)

B1a2d. previous three sets of criteria not met, *Dicranum scoparium* ≥ 11% cover: **c52** Oak—*Dicranum scoparium*: Typic subcommunity (if not, go to **C**)

B1b. Dominated by dense cover of native shrubs (thickets): (if not, see **B1c**)

B1b1. *Rosa nutkana* usually dominant: (if not, see **B1b2**)

B1b1a. *Lonicera ciliosa* and/or *Rosa nutkana* ≥ 11% cover, the other of which ≥ 2%: **c8** Oak—*Symphoricarpos albus—Rosa nutkana—Lonicera ciliosa* subcommunity (if not, see **B1b1b**)

B1b1b. *Oemleria cerasiformis* and/or *Rosa nutkana* ≥ 11% cover (usually > 26%), the other of which > 2%: **c9** Oak—*Symphoricarpos albus—Rosa nutkana—Oemleria cerasiformis* subcommunity (if not, go to **C**)

B1b2. *Rhytidiadelphus triquetris* and/or *Holodiscus discolor* ≥ 11% cover (usually > 26%), rocky substrate: **c10** Oak—(Fd)—*Holodiscus discolor—Symphoricarpos albus—Rhytidiadelphus triquetris* (if not, see **B1b3**)

B1b3. *Polypodium glycyrrhiza* ≥ 11% cover, usually with *Holodiscus discolor* and/or *Symphoricarpos albus* ≥ 11% cover, bedrock landscape: **c15** Oak—*Holodiscus discolor—Symphoricarpos albus—Polypodium glycyrrhiza* (if not, go to **C**)

B1c. Dominated by native herbaceous vegetation: (if not, go to **B1d**)

B1c1. *Festuca idahoensis* usually dominant: (if not, see **B1c2**)

B1c1a. *Vicia americana* ≥ 2 % cover (usually ≥ 11%), *Festuca idahoensis* often ≥ 11% cover, seaside location, usually krummholz oak form: **c42** Krummholz Oak—*Festuca idahoensis—Vicia americana* subcommunity (if not, see **B1c1b**)

B1c1b. *Trifolium microcephalum* ≥ 11% cover, *Festuca idahoensis* usually ≥ 11%: **c27** Oak—*Festuca idahoensis—Trifolium microcephalum* subcommunity (if not, see **B1c1c**)

B1c1c. *Cerastium arvense* ≥ 11% cover, *Festuca idahoensis* usually ≥ 11%, other species ≥ 11%: **c25** Oak—*Festuca idahoensis—Cerastium arvense* subcommunity (if not, see **B1c1d**)

B1c1d. previous three sets of criteria not met, *Festuca idahoensis* ≥ 11% cover, other species ≤ 11%: **c20** Oak—*Festuca idahoensis*: Typic subcommunity (if not, go to **C**)

B1c2. *Lathyrus nevadensis* ≥ 11% cover, other species various: **c41** Oak—*Lathyrus nevadensis* (if not, see **B1c3**)

B1c3. *Bromus carinatus* ≥ 11% cover, other species various: **c43** Oak—*Bromus carinatus* (if not, see **B1c4**)

B1c4. *Elymus glaucus* ≥ 11% cover, ≥ other herb species: **c47** Oak—*Elymus glaucus* (if not, see **B1c5**)

B1c5. *Melica subulata* ≥ 11% cover, ≥ other species: **c13** Oak—*Melica subulata* (if not, see **B1c6**)

B1c6. *Carex inops* ≥ 11% cover, ≥ other species: **c14** Oak—*Carex inops* (if not, go to **C**)

B1d. Previous criteria sets not met, dry, colluvial sites, dominated by native shrubs: (if not, go to **C**)

B1d1. *Lonicera hispidula* ≥ 11% cover ≥ other species: **c16a** Oak—*Lonicera hispidula* (colluvial) (if not, see **B1d2**)

B1d2. *Mahonia aquifolium* ≥ 11% cover ≥ other species: **c26** Oak—*Mahonia aquifolium* (if not, go to **C**)

B2. Mostly introduced dominant species, or mixed with native secondary dominants, broom absent or of secondary importance ≤ 11–15% (low Cover Class "3") (if not, see **B3**)

B2a. *Dactylis glomerata* usually dominant: (if not, see **B2b**)

B2a1. *Bromus carinatus* ≥ 11% cover, *Dactylis glomerata* ≥ 26% ≥ other species: **c28b** Oak—*Dactylis glomerata—Bromus carinatus* subcommunity (if not, see **B2a2**)

B2a2. *Arrhenatherum elatius* >= 11% cover, *Dactylis glomerata* ≥ 11% cover, either ≥ other species: **c30** Oak—*Dactylis glomerata—Arrhenatherum elatius* subcommunity (if not, see **B2a3**) (also in the key below)

B2a3. *Agrostis stolonifera* ≥ 11% cover, *Dactylis glomerata* usually ≥ 11%, either ≥ other species: **c49** Oak—*Dactylis glomerata—Agrostis stolonifera* subcommunity (if not, see **B2a4**) (also in the key below)

B2a4. previous three sets of criteria not met, *Dactylis glomerata* ≥ 11% cover ≥ other herb species: **c28a** Oak—*Dactylis glomerata*: Typic subcommunity (if not, go to **C**)

B2b. *Cynosurus echinatus* ≥ 26% cover, ≥ other species: **c21** Oak—*Cynosurus echinatus* (late-season) (if not, see **B2c**)

B2c. *Bromus sterilis* ≥ 11% cover, usually ≥ 26%: **c23** Oak—*Bromus sterilis* (if not, see **B2d**.) (also in the key below)

B2d. *Anthoxanthum odoratum* ≥ 11% cover, usually ≥ 26%, ≥ other species: **c31a** Oak—*Anthoxanthum odoratum* (if not, see **B2e**)

B2e. *Poa pratensis* and/or *Vicia sativa* ≥ 11% cover, ≥ other herb species: **c29a** Oak—*Poa pratensis* (if not, go to **C**)

B3. Broom dominant, ≥ 15% cover, (> low class "3"), usually > 26%: (if not, go to **C**)

B3a. Bedrock landscape, dominated by combinations of mosses and herbaceous vegetation: (if not, see **B3b**)

B3a1. *Rhacomitrium canescens* usually dominant, ≥ 26% cover: (if not, see **B3b**)

B3a1a. *Bromus tectorum* ≥ 11% cover, *Rhacomitrium canescens* usually ≥ 11% (often > 51%): **c22** Oak—Broom—*Rhacomitrium canescens*—*Bromus tectorum* subcommunity (if not, see **B3a1b**) (also in the key above)

B3a1b. *Festuca bromoides* ≥ 11% cover, ≥ other species, *Rhacomitrium canescens* usually ≥ 11%: **c3** Oak—Broom—*Rhacomitrium canescens*—*Festuca bromoides*—*Aira* subcommunity (if not, see **B3a1c**)

B3a1c. *Rhacomitrium canescens* ≥ 26% cover, > other species: **c17** Oak—Broom—*Rhacomitrium canescens*: Typic subcommunity (if not, go to **C**) (also in the key above)

B3b. Other broom sites, dominated primarily by introduced herbaceous vegetation (if not, go to **C**)

B3b1. *Elymus glaucus* ≥ 11% cover: **c6** Oak—Broom—*Elymus glaucus* (if not, see **B3b2**)

B3b2. *Cynosurus echinatus* ≥ 11% cover, ≥ other species, late-season plant community: **c2** Oak—Broom—*Cynosurus echinatus* (if not, see **B3b3**)

B3b3. *Anthoxanthum odoratum* ≥ 11% cover (usually ≥ 26%) > other species: **c31b** Oak—Broom—*Anthoxanthum odoratum* (if not, see **B3b4**)

B3b4. *Dactylis glomerata* usually dominant: (if not, see **B3b5**)

B3b4a. *Dactylis glomerata* ≥ 11% cover, (usually ≥ 26%) ≥ other species: **c5** Oak—Broom—*Dactylis glomerata* (if not, see **B3b4b**)

B3b4b. *Arrhenatherum elatius* ≥ 11% cover, *Dactylis glomerata* ≥ 11% cover, either ≥other species: **c30** Oak—*Dactylis glomerata*—*Arrhenatherum elatius* subcommunity (if not, see **B3b4c**) (also in the key above)

B3b4c. *Agrostis stolonifera* ≥ 11% cover, *Dactylis glomerata* usually 11%, either ≥ other species: **c49** Oak—*Dactylis glomerata*—*Agrostis stolonifera* subcommunity (if not, go to **C**) (also in the key above)

B3b5. *Poa pratensis* ≥ 11% cover, (usually ≥ 26%) ≥ other species: **c4** Oak—Broom—*Poa pratensis* (if not, see **B3b6**)

B3b6. *Bromus sterilis* ≥ 11% cover, usually ≥ 26%: **c23** Oak—*Bromus sterilis* (if not, go to **C**) (also in the key above)

C. Repeat key and obtain best "fit". If there is no "fit", note as an unrecognized community.

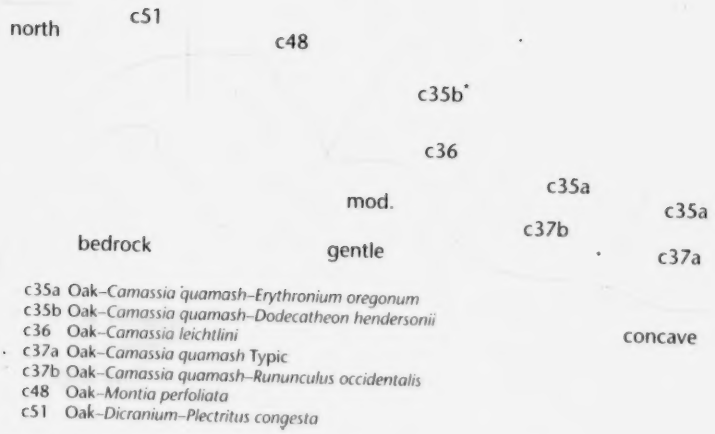


FIGURE 4 *Landscape diagram for early season plant communities.*

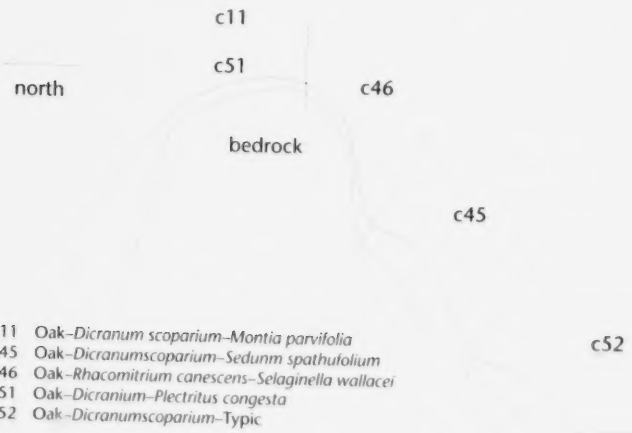


FIGURE 5 *Landscape diagram for native bedrock plant communities.*

* Both communities indicated occur at the same slope position.

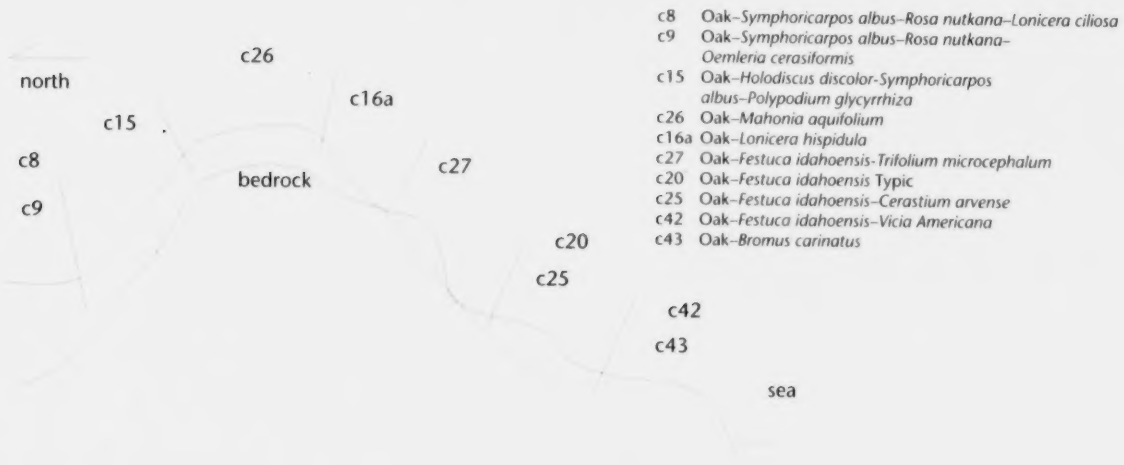


FIGURE 6 *Landscape diagram for other native plant communities (1).*

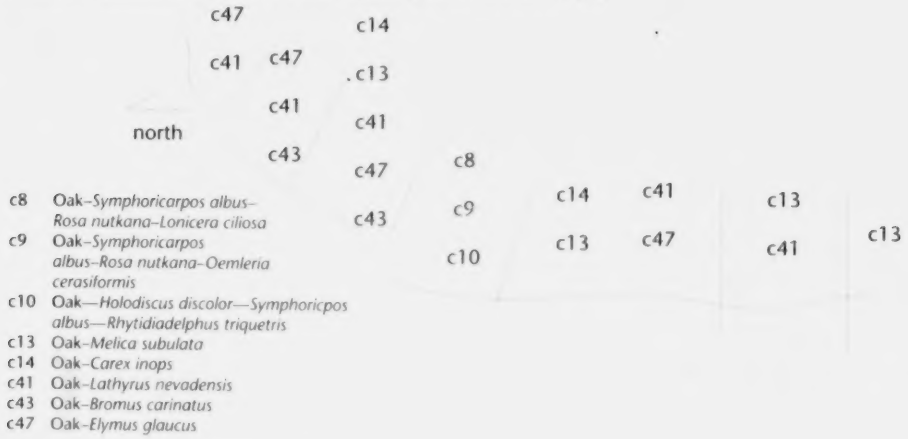


FIGURE 7 *Landscape diagram for other native plant communities (2).*

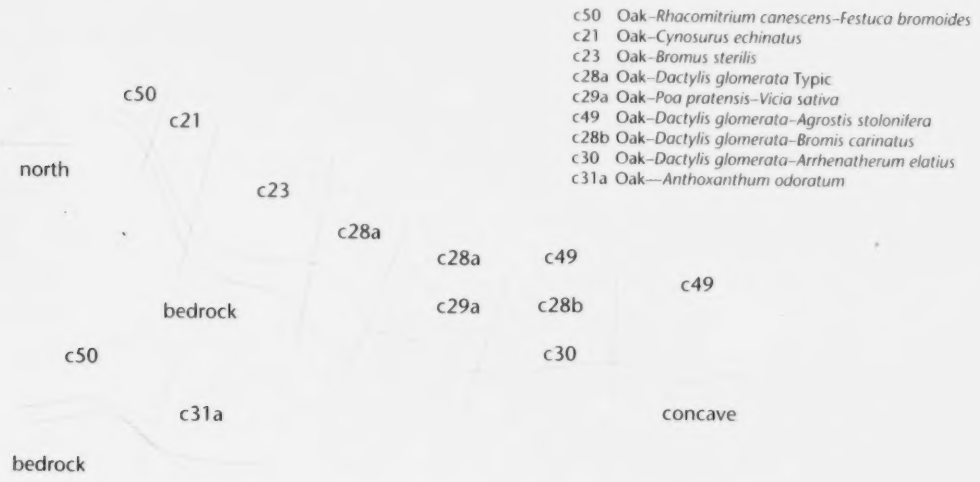
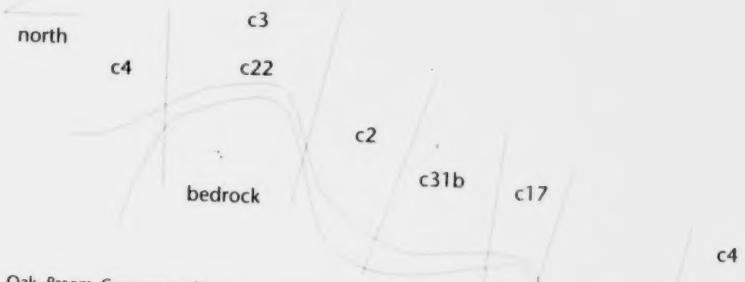


FIGURE 8 *Landscape diagram for first-order disturbance plant communities.*



c2 Oak–*Broom–Cynosurus echinatus*
c3 Oak–*Broom– Rhacomitrium canescens–Festuca bromoides–Aira*
c4 Oak–*Broom–Poa pratensis*
c5 Oak–*Broom–Dactylis glomerata*
c6 Oak–*Broom–Elymus glaucus*
c17 Oak–*Broom–Rhacomitrium canescens–*Typic
c22 Oak–*Broom–Rhacomitrium canescens–Bromus tectorum*
c31b Oak–*Broom–Anthoxanthum odoratum*

FIGURE 9 *Landscape diagram for second-order disturbance plant communities.*

Ecological moisture regime	Geographic Area				
	Nanaimo–Duncan	Northern Gulf Islands	Southern Gulf Islands	Saanich Peninsula	Western Shore
Very xeric					
Xeric					
Subxeric					
Submesic					
Mesic					
Permesic					
Subhygric					

Legend c36: c35b: c37a: c35a:

Plant communities are given by their alpha-numeric designation. See Figure 4 for the names and Erickson (1996) Section 5.11 for the geographic areas.
NOTE that small offsets in either axis are for the visibility of the plant communities and do not represent refined distinctions in occurrence.

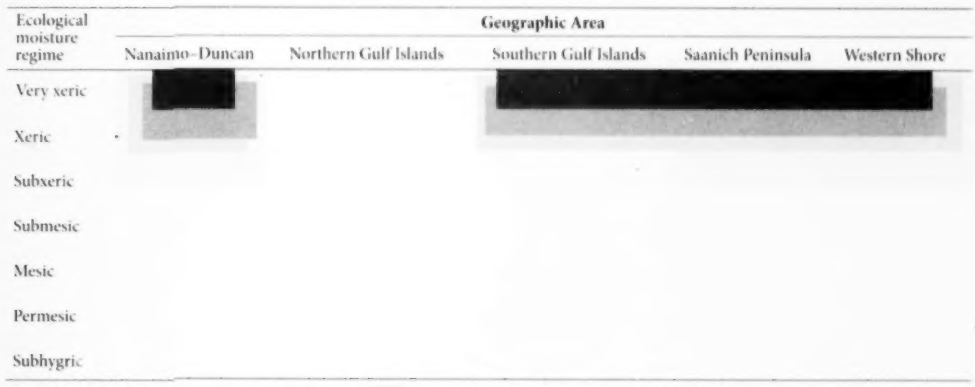
FIGURE 10 *Distribution and moisture regime of early season plant communities (1).*

Ecological moisture regime	Geographic Area				
	Nanaimo–Duncan	Northern Gulf Islands	Southern Gulf Islands	Saanich Peninsula	Western Shore
Very xeric					
Xeric					
Subxeric					
Submesic					
Mesic					
Permesic					
Subhygric					

Legend c48: c51: c37b: c35b:

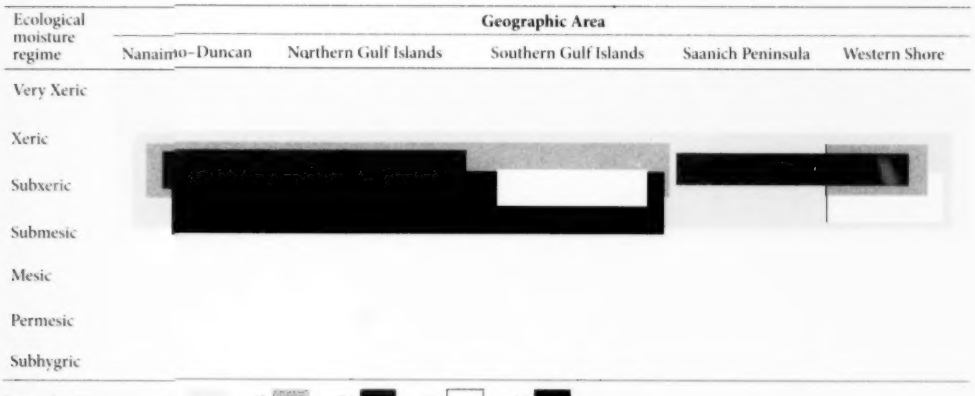
Plant communities are given by their alpha-numeric designation. See Figure 4 for the names and Erickson (1996) Section 5.11 for the geographic areas.
NOTE that small offsets in either axis are for the visibility of the plant communities and do not represent refined distinctions in occurrence.

FIGURE 11 *Distribution and moisture regime of early season plant communities (2).*



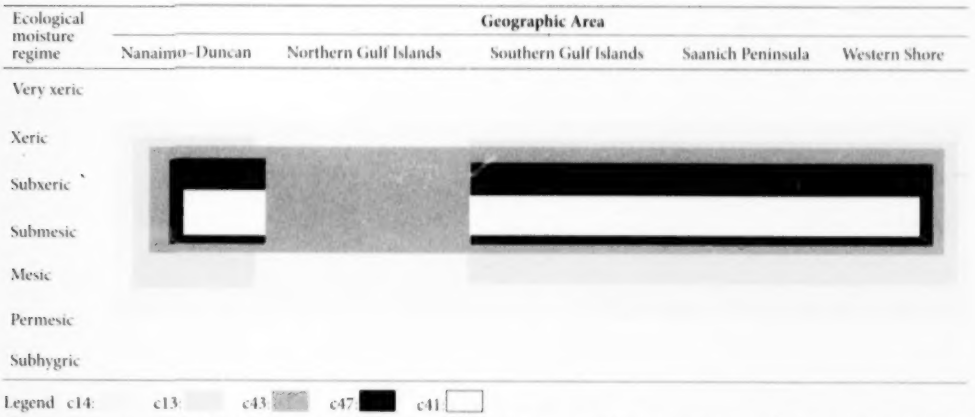
Plant communities are given by their alpha-numeric designation. See Figure 5 for the names and Erickson (1996) Section 5.11 for the geographic areas. NOTE that small offsets in either axis are for the visibility of the plant communities and do not represent refined distinctions in occurrence.

FIGURE 12 *Distribution and moisture regime of native plant communities of bedrock habitats (1).*



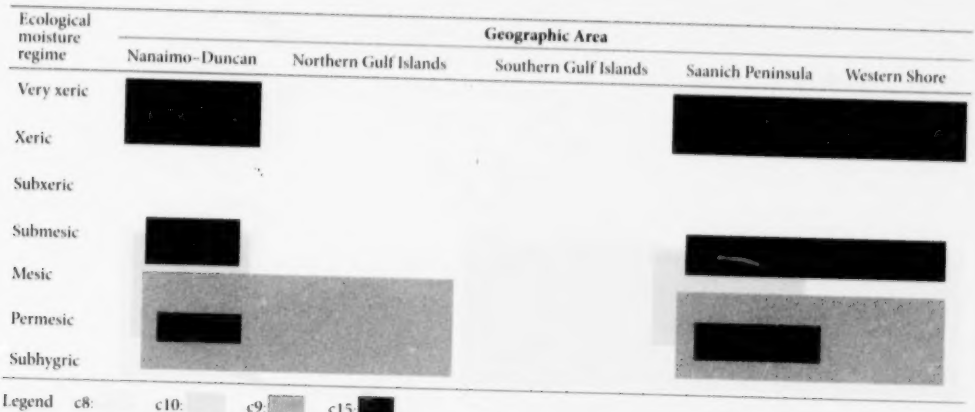
Plant communities are given by their alpha-numeric designation. See Figure 6 for the names and Erickson (1996) Section 5.11 for the geographic areas. NOTE that small offsets in either axis are for the visibility of the plant communities and do not represent refined distinctions in occurrence.

FIGURE 13 *Distribution and moisture regime of other native plant communities (1).*



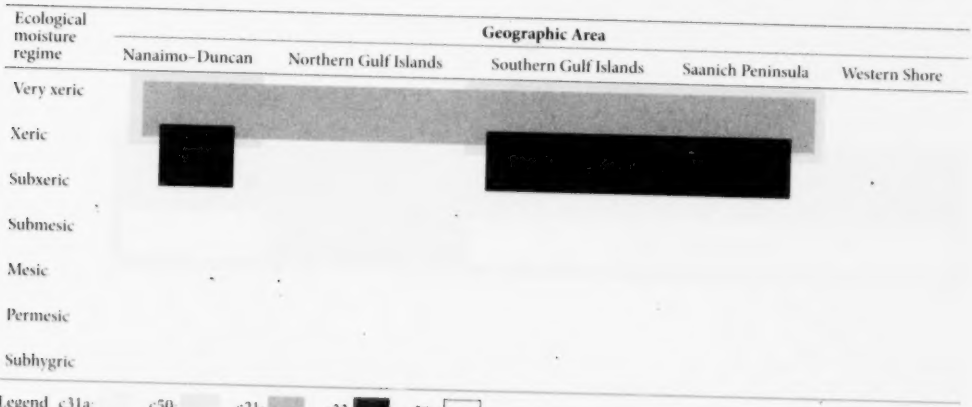
Plant communities are given by their alpha-numeric designation. See Figure 7 for the names and Erickson (1996) Section 5.11 for the geographic areas. NOTE that small offsets in either axis are for the visibility of the plant communities and do not represent refined distinctions in occurrence.

FIGURE 14 *Distribution and moisture regime of other native plant communities (2).*



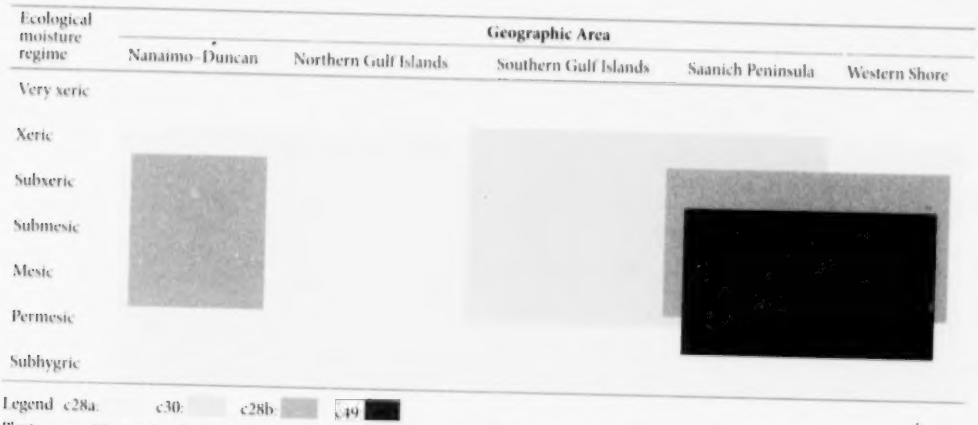
Plant communities are given by their alpha-numeric designation. See Figures 6 and 7 for the names and Erickson (1996) Section 5.11 for the geographic areas.
NOTE that small offsets in either axis are for the visibility of the plant communities and do not represent refined distinctions in occurrence.

FIGURE 15 *Distribution and moisture regime of other native plant communities (3).*



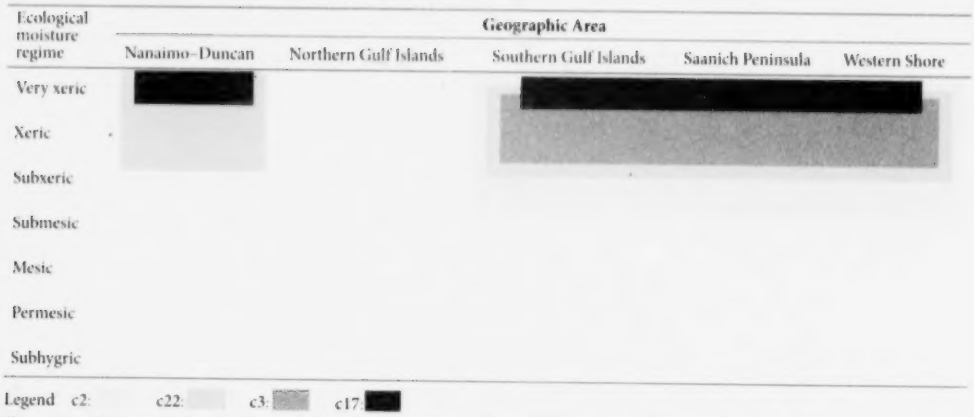
Plant communities are given by their alpha-numeric designation. See Figure 8 for the names and Erickson (1996) Section 5.11 for the geographic areas.
NOTE that small offsets in either axis are for the visibility of the plant communities and do not represent refined distinctions in occurrence.

FIGURE 16 *Distribution and moisture regime for first-order disturbance plant communities (non-broom) (1).*



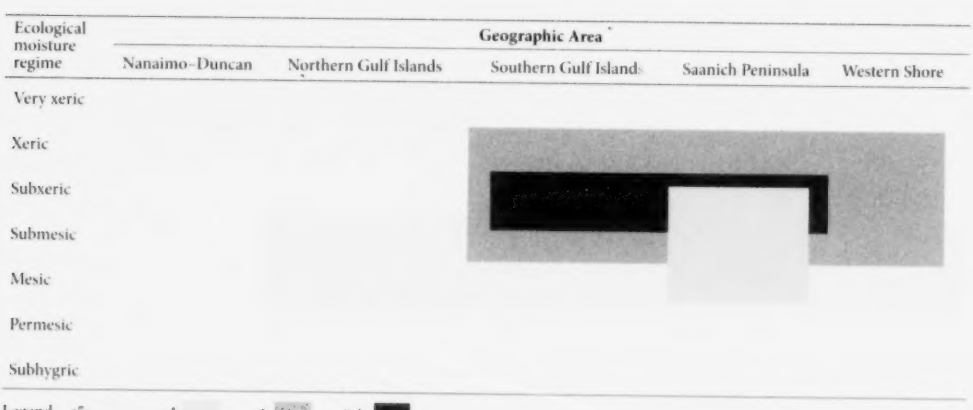
Plant communities are given by their alpha-numeric designation. See Figure 8 for the names and Erickson (1996) Section 5.11 for the geographic areas.
NOTE that small offsets in either axis are for the visibility of the plant communities and do not represent refined distinctions in occurrence.

FIGURE 17 *Distribution and moisture regime for first-order disturbance plant communities (non-broom) (2).*



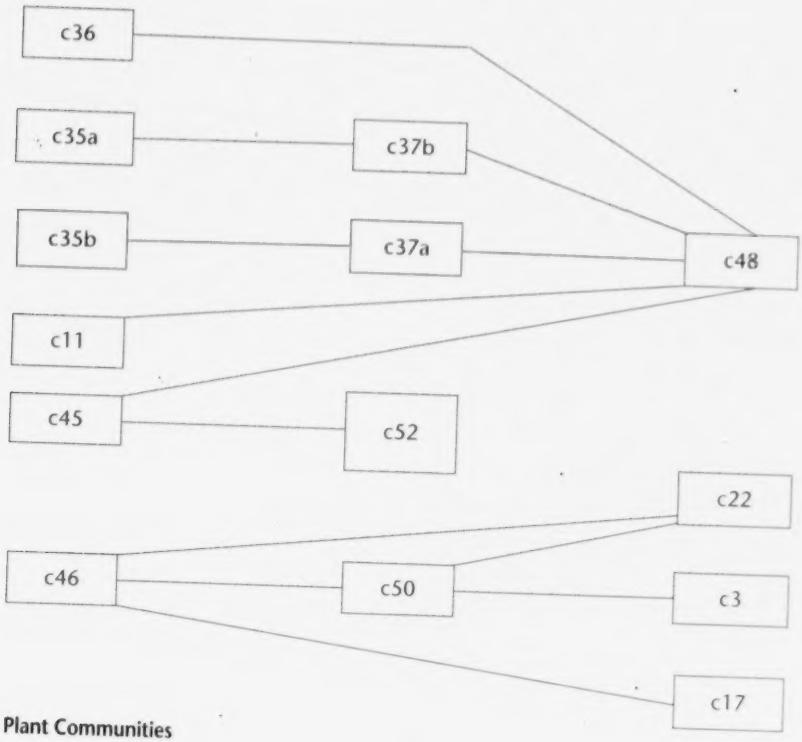
Plant communities are given by their alpha-numeric designation. See Figure 9 for the names and Erickson (1996) Section 5.11 for the geographic areas. NOTE that small offsets in either axis are for the visibility of the plant communities and do not represent refined distinctions in occurrence.

FIGURE 18 *Distribution and moisture regime for second-order disturbance plant communities (broom series) (1).*



Plant communities are given by their alpha-numeric designation. See Figure 9 for the names and Erickson (1996) Section 5.11 for the geographic areas. NOTE that small offsets in either axis are for the visibility of the plant communities and do not represent refined distinctions in occurrence.

FIGURE 19 *Distribution and moisture regime for second-order disturbance plant communities (broom series) (2).*

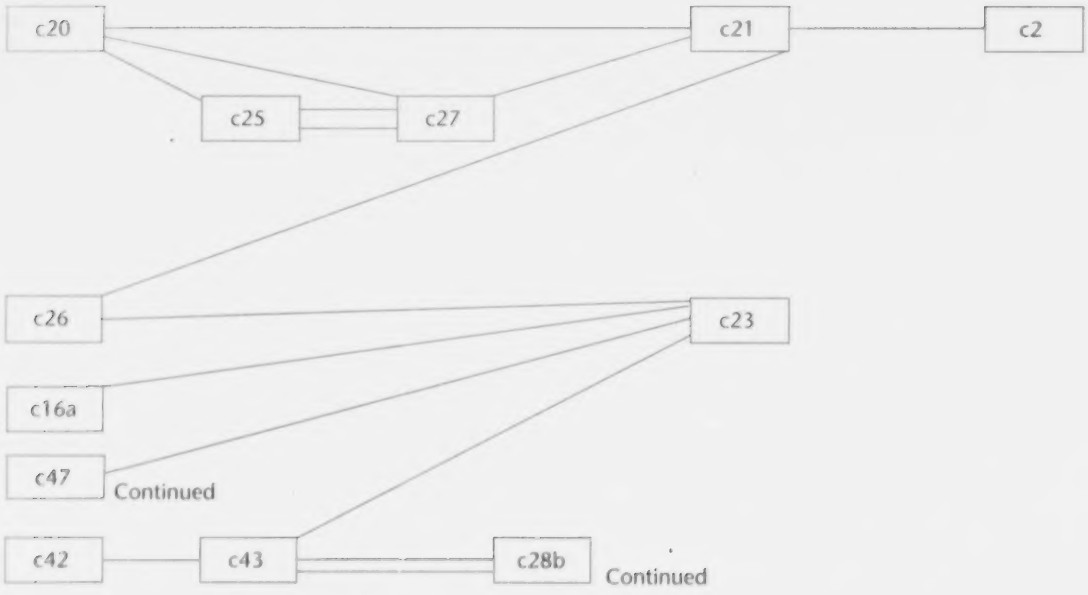


Plant Communities

c3: Oak—*Broom Rhacomitrium canescens—Festuca bromoides—Aira*
c11: Oak—*Dicranum scoparium—Montia parvifolia*
c22: Oak—Broom—*Rhacomitrium canescens—Bromus tectorum*
c35a: Oak—*Camassia quamash—Erythronium oregonum*
c35b: Oak—*Camassia quamash—Dodecatheon hendersonii*
c36: Oak—*Camassia leichtlinii*
c37b: Oak—*Camassia quamash—Ranunculus occidentalis*
c37a: Oak—*Camassia quamash* Typic
c45: Oak—*Dicranum scoparium—Sedum spathifolium*
c50: Oak—*Rhacomitrium canescens—Festuca bromoides*
c52: Oak—*Dicranum scoparium* Typic
c48 Oak—*Montia perfoliata*
c46: Oak—*Rhacomitrium canescens—Selaginella wallacei*
c17: Oak—Broom—*Rhacomitrium canescens* Typic

Notes: These origins and derivations of the plant communities are suggested to have occurred as a result of disturbance and understorey succession. No successional role is suggested for c51: Oak—*Dicranum scoparium—Plectritus congesta*

FIGURE 20 *Suggested origins and derivations (1): early season and rock outcrops.*

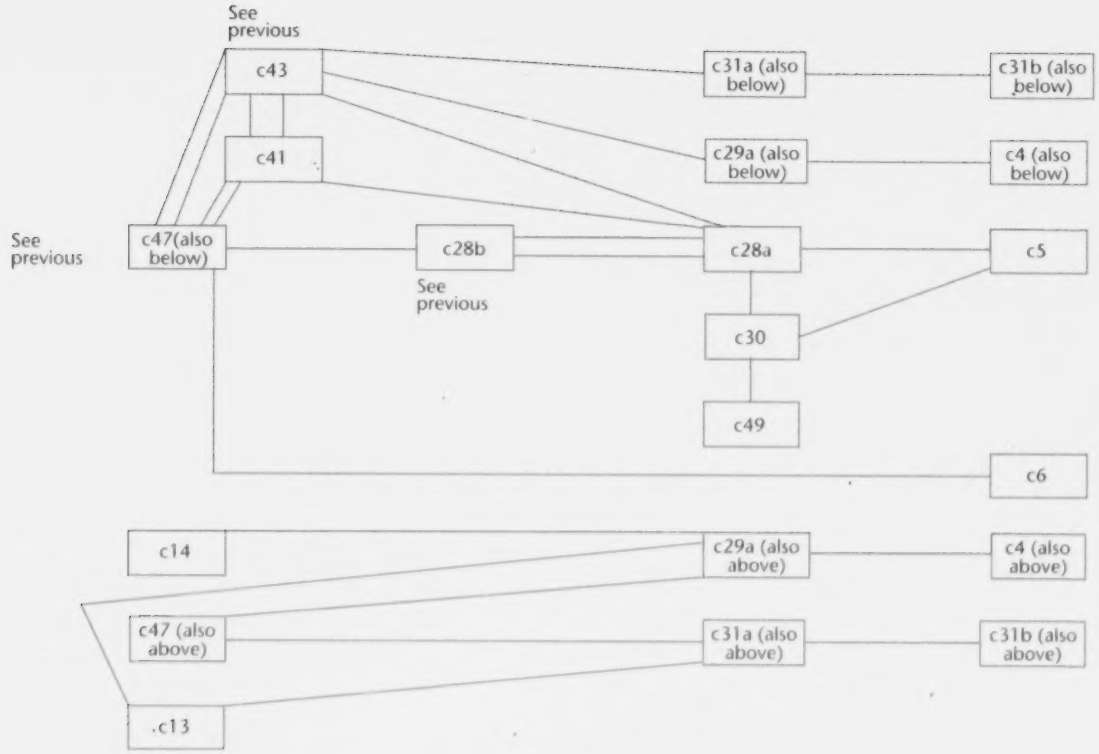


Plant Communities

c2: Oak—Broom—*Cynosurus echinatus*
c16a: Oak—*Lonicera hispidula*
c20: Oak—*Festuca idahoensis* Typic
c21: Oak—*Cynosurus echinatus*
c23: Oak—*Bromus sterilis*
c25: Oak—*Festuca idahoensis*—*Cerastium arvense*
c26: Oak—*Mahonia aquifolium*
c27: Oak—*Festuca idahoensis*—*Trifolium microcephalum*
c28b: Oak—*Dactylis glomerata*—*Bromus carinatus*
c42: Krummholz Oak—*Festuca idahoensis*—*Vicia americana*
c43: Oak—*Bromus carinatus*
c47: Oak—*Elymus glaucus*

Note: These origins and derivations of the plant communities are suggested to have occurred as a result of disturbance and understorey succession.

FIGURE 21 *Suggested origins and derivations (2): xeric communities.*



Plant Communities

c43: Oak—*Bromus carinatus*
c41: Oak—*Festuca idahoensis—Vicia americana*
c47: Oak—*Elymus glaucus*
c14: Oak—*Carex inops*
c13: Oak—*Melica subulata*
c28b: Oak—*Dactylis glomerata—Bromus carinatus*
c28a: Oak—*Dactylis glomerata*
c30: Oak—*Dactylis glomerata—Arrhenatherum elatius*
c49: Oak—*Dactylis glomerata—Agrostis stolonifera*
c29a: Oak—*Poa pratensis—Vicia sativa*
c31a: *Oak—Anthoxantum odoratum*
c5: Oak—Broom—*Dactylis glomerata*
c6: Oak—Broom—*Elymus glaucus*
c4: Oak—Broom—*Poa pratensis*
c31b: Oak—Broom—*Anthoxanthum odoratum*

Notes: These origins and derivations of the plant communities are suggested to have occurred as a result of disturbance and understorey succession.

No successional role is suggested for the communities c15: Oak—*Holodiscus discolor—Symphoricarpos albus–Polypodium glycyrrhiza*; c10: Oak—Holodiscus discolor—*Symphoricarpos albus—Rhytidiadelphus triquetris* c9: Oak—*Symphoricarpos albus—Rosa nutkana—Oemleria cerasiformis*; and c8: Oak—*Symphoricarpos albus—Rosa nutkana—Lonicera ciliosa*

FIGURE 22 *Suggested origins and derivations (3): other communities.*

TABLE 4 *Short version of presence and cover for early season plant communities*

	c51 Oak-Dicr sco-Plec con s.c. n=3		c35b Oak-Cama qua-Dode hen s.c. n=4		c37a Oak-Cama qua: typic n=12		c37b Oak-Cama qua-Ranu occ s.c. n=6		c37a Oak-Cama qua-Eryt ore s.c. n=5		c36 Oak-Cama lei n=50		c48 Oak-Mont per n=12	
Plant species*	Pres**	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov
Festbro	**0.66667**	**4**	0	0	0.25	2.04167	0.16667	1	0	0	0.64	4.1	0.66667	9.29167
Seduspa	**1**	**6.33333**	0.25	0.125	0.08333	0.04167	0	0	0.2	1.2	0.1	0.4	0.16667	0.08333
Heucmic	**0.66667**	**2.16667**	0.25	0.125	0.08333	0.04167	0	0	0.2	0.1	0.04	0.13	0.08333	0.04167
Anthodo	**1**	**8.16667**	0.5	0.25	0.58333	7.25	0.66667	3.25	0.4	4.8	0.46	6.71	0.58333	6.04167
Eurhore	**0.66667**	**8**	0	0	0.25	2.5	0.16667	1	0.2	1.2	0.34	3.16	0.41667	5.5
Rubuurs	**1**	**2.33333**	0	0	0	0	0	0	0	0	0.08	0.39	0.08333	0.04167
HolodisB1	**0.66667**	**14.6667**	0.25	4.5	0.16667	5.75	0.33333	2	0.4	13.8	0.28	5.96	0.41667	19.8333
Osmochi	**1**	**2.33333**	0	0	0.16667	1	0	0	0.2	0.1	0.18	0.42	0.33333	0.625
Ceraarv	**0.66667**	**2.16667**	0.5	1.625	0.25	0.125	0.33333	3.08333	0.2	1.2	0.4	1.56	0.25	0.125
Polymun	**0.66667**	**0.33333**	0	0	0.33333	0.16667	0.16667	0.08333	0	0	0.14	0.18	0.25	0.125
Delpmen	**0.66667**	**2.16667**	0	0	0.08333	0.04167	0.16667	0.08333	0	0	0.22	1.25	0	0
Melisub	**0.66667**	**6.16667**	0	0	0.33333	6.83333	0.16667	0.08333	0.2	0.1	0.26	2.32	0.41667	7.33333
Brommol	**0.66667**	**2.16667**	0	0	0.25	1.58333	0.33333	2	0	0	0.52	1.71	0.41667	1.58333
Montpar	**0.66667**	**4**	0.25	0.125	0	0	0	0	0.2	3.6	0.14	0.4	0.16667	3
Geramol	**0.66667**	**1.33333**	0	0	0.41667	3.04167	0.5	2.08333	0	0	0.48	2.52	0.41667	1.125
Viciame	**0.66667**	**2.16667**	0.25	0.125	0.25	0.125	0	0	0.4	1.3	0.32	3.08	0.08333	0.04167
Rhyttri	**1**	**20.6667**	0.5	6	0.25	4.16667	0	0	0.2	7.6	0.2	4.24	0.5	13
Collpar	**0.66667**	**0.33333**	**0.75**	**1.75**	0.25	0.125	0.33333	1.08333	0	0	0.1	0.27	0.08333	0.04167
Pleccon	**1**	**24.6667**	**0.75**	**1.75**	0.33333	1.08333	0.16667	1	0.2	0.1	0.2	0.89	0.16667	0.54167
CytiscoB2	1	4.16667	**0.75**	**16**	0.58333	14.2917	0	0	0.4	0.2	0.66	10.3	**0.83333**	**14.6667**

* Species are designated by the first 4 letters of the genus followed by the first 3 letters of the species.

** Mean presence and average cover for shrubs, herbs, and moss layer species with a presence ≥ 0.70 in at least one community.

■ Species used in naming.

Species with ≥ 0.70 presence cover.

TABLE 4 *Continued*

	c51 Oak-Dicr sco-Plec con s.c. n=3		c35b Oak-Cama qua-Dode hen s.c. n=4		c37a Oak-Cama qua: typic n=12		c37b Oak-Cama qua-Ranu occ s.c. n=6		c37a Oak-Cama qua-Eryt ore s.c. n=5		c36 Oak-Cama lei n=50		c48 Oak-Mont per n=12	
Plant species*	Pres**	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov
Bromcar	**0.66667**	**4**	**0.75**	**1.75**	0.58333	2.20833	0.66667	5.08333	0.4	1.3	0.66	4.89	**0.83333**	**3.70833**
Dicrsco	**1**	**11**	**0.75**	**4.5**	0.25	1.04167	0.16667	3	0.4	4.8	0.28	2.64	0.41667	6.79167
Dactglo	**0.66667**	**8**	**0.5**	**0.25**	0.41667	6.25	**0.83333**	**6.08333**	**0.8**	**6.1**	0.62	10.96	0.33333	2
Erytore	**0.66667**	**2.16667**	**0.5**	**4.625**	0.33333	1.08333	0.5	2.08333	**1**	**21**	0.3	1.45	0.25	0.58333
SympalbB2	**1**	**0.5**	**0.75**	**6.125**	**0.75**	**12.0833**	0.66667	6	**1**	**21.2**	**0.84**	**16.1**	0.58333	7.70833
Vicisat	**0.66667**	**2.16667**	0	0	0.66667	3.625	**1**	**6.16667**	0.6	2.5	**0.74**	**6.6**	0.58333	5.79167
Vicihir	**0.66667**	**0.33333**	0.5	0.25	0.58333	5.58333	0.5	4.08333	0.4	1.3	**0.7**	**6.72**	0.58333	2.66667
Camalei	**1**	**20.6667**	0	0	0.16667	1	0.16667	1	0.2	3.6	**1**	**32**	**0.83333**	**9.75**
Elymgla	**0.66667**	**2.16667**	**1**	**4.625**	0.66667	5.08333	0.5	1.16667	0.4	1.3	**0.84**	**8.17**	**0.91667**	**6.66667**
Sanicra	**1**	**8.16667**	**0.75**	**1.75**	**1**	**10.5417**	0.5	5	0.4	1.3	**0.76**	**6.56**	**0.75**	**8.5**
Stelmed	**0.66667**	**0.33333**	**1**	**0.5**	0.66667	3.16667	**0.83333**	**3.16667**	0.6	0.3	0.42	1.44	**0.75**	**5.58333**
Poa pra	**0.66667**	**8**	0.25	0.125	0.66667	7.08333	**1**	**9.5**	0.6	6	**0.76**	**10.24**	**0.75**	**6.33333**
Bromste	**0.66667**	**2.16667**	0.25	0.125	0.33333	2.08333	0.66667	10.4167	0	0	0.66	5.7	**0.66667**	**5.83333**
Montper	**1**	**14.8333**	0.25	0.125	0.5	2.625	0.33333	1.08333	0	0	0.42	3.05	**1**	**25**
Galiapa	**1**	**14**	**1**	**3.25**	**0.91667**	**3.75**	0.66667	4.16667	0.6	2.5	**0.86**	**6.72**	**0.83333**	**15.2917**
Rumeace	0.33333	0.16667	**0.75**	**0.375**	0.58333	1.66667	0.33333	0.16667	0.2	1.2	0.34	0.5	0.58333	1.20833
Achimil	0.33333	0.16667	**1**	**0.5**	0.25	0.58333	0.16667	1	0	0	0.34	0.96	0.5	1.16667
Rhaccan	0.33333	2	**1**	**15.625**	0.16667	2	0.16667	1	0.2	1.2	0.26	3.32	0.08333	3.16667
Brodcor	0.33333	2	**0.75**	**0.375**	0.58333	7.70833	0.33333	1.08333	0.6	4.9	0.38	1.42	0.25	1.04167
Careino	0	0	**0.75**	**6.125**	0.58333	9.33333	0.33333	6	0.6	4.9	0.24	0.69	0.5	2.625
Lomautr	0.33333	2	**0.75**	**1.75**	0.5	1.16667	0.5	3	0.2	0.1	0.12	0.17	0.08333	0.04167
Polyjun	0.33333	2	**1**	**4.625**	0.08333	0.5	0	0	0.2	1.2	0.06	0.36	0.16667	1
Dodehen	0	0	**1**	**16**	0.41667	1.125	0.33333	0.16667	0.2	0.1	0.26	0.46	0.16667	0.54167
Luzumul	0	0	**0.75**	**1.75**	0.25	0.58333	0.16667	1	0.4	0.2	0.12	0.06	0.16667	0.54167
Trifolg	0	0	**0.75**	**0.375**	0.08333	0.04167	0.16667	0.08333	0	0	0.06	0.03	0	0

TABLE 4 *Continued*

Plant species*	c51 Oak-Dicr sco-Plec con s.c. n=3		c35b Oak-Cama qua-Dode hen s.c. n=4		c37a Oak-Cama qua: typic n=12		c37b Oak-Cama qua-Ranu occ s.c. n=6		c37a Oak-Cama qua-Eryt ore s.c. n=5		c36 Oak-Cama lei n=50		c48 Oak-Mont per n=12	
	Pres**	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov
Bromcar	**0.66667**	**4**	**0.75**	**1.75**	0.58333	2.20833	0.66667	5.08333	0.4	1.3	0.66	4.89	**0.83333**	**3.70833**
Dicrsco	**1**	**14**	**0.75**	**4.5**	0.25	1.04167	0.16667	3	0.4	4.8	0.28	2.64	0.41667	6.79167
Dactglo	**0.66667**	**8**	**0.5**	**0.25**	0.41667	6.25	**0.83333**	**6.08333**	**0.8**	**6.1**	0.62	10.96	0.33333	2
Erytore	**0.66667**	**2.16667**	**0.5**	**4.625**	0.33333	1.08333	0.5	2.08333	**1**	**28.6**	0.3	1.45	0.25	0.58333
SympalbB2	**1**	**0.5**	**0.75**	**6.125**	**0.75**	**12.0833**	0.66667	6	**1**	**21.2**	**0.84**	**16.1**	0.58333	7.70833
Vicisat	**0.66667**	**2.16667**	0	0	0.66667	3.625	**1**	**6.16667**	0.6	2.5	**0.74**	**6.6**	0.58333	5.79167
Vicihir	**0.66667**	**0.33333**	0.5	0.25	0.58333	5.58333	0.5	4.08333	0.4	1.3	**0.7**	**6.72**	0.58333	2.66667
Camalei	**1**	**20.6667**	0	0	0.16667	1	0.16667	1	0.2	3.6	**1**	**22**	**0.83333**	**9.75**
Elymgla	**0.66667**	**2.16667**	**1**	**4.625**	0.66667	5.08333	0.5	1.16667	0.4	1.3	**0.84**	**8.17**	**0.91667**	**6.66667**
Sanicra	**1**	**8.16667**	**0.75**	**1.75**	**1**	**10.5417**	0.5	5	0.4	1.3	**0.76**	**6.56**	**0.75**	**8.5**
Stelmed	**0.66667**	**0.33333**	**1**	**0.5**	0.66667	3.16667	**0.83333**	**3.16667**	0.6	0.3	0.42	1.44	**0.75**	**5.58333**
Poa pra	**0.66667**	**8**	0.25	0.125	0.66667	7.08333	**1**	**9.5**	0.6	6	**0.76**	**10.24**	**0.75**	**6.33333**
Bromste	**0.66667**	**2.16667**	0.25	0.125	0.33333	2.08333	0.66667	10.4167	0	0	0.66	5.7	**0.66667**	**5.83333**
Montper	**1**	**14.8333**	0.25	0.125	0.5	2.625	0.33333	1.08333	0	0	0.42	3.05	**1**	**23**
Galiapa	**1**	**14**	**1**	**3.25**	**0.91667**	**3.75**	0.66667	4.16667	0.6	2.5	**0.86**	**6.72**	**0.83333**	**15.2917**
Rumeace	0.33333	0.16667	**0.75**	**0.375**	0.58333	1.66667	0.33333	0.16667	0.2	1.2	0.34	0.5	0.58333	1.20833
Achimil	0.33333	0.16667	**1**	**0.5**	0.25	0.58333	0.16667	1	0	0	0.34	0.96	0.5	1.16667
Rhaccan	0.33333	2	**1**	**15.625**	0.16667	2	0.16667	1	0.2	1.2	0.26	3.32	0.08333	3.16667
Brodcor	0.33333	2	**0.75**	**0.375**	0.58333	7.70833	0.33333	1.08333	0.6	4.9	0.38	1.42	0.25	1.04167
Careino	0	0	**0.75**	**6.125**	0.58333	9.33333	0.33333	6	0.6	4.9	0.24	0.69	0.5	2.625
Lomautr	0.33333	2	**0.75**	**1.75**	0.5	1.16667	0.5	3	0.2	0.1	0.12	0.17	0.08333	0.04167
Polyjun	0.33333	2	**1**	**4.625**	0.08333	0.5	0	0	0.2	1.2	0.06	0.36	0.16667	1
Dodehen	0	0	**1**	**18**	0.41667	1.125	0.33333	0.16667	0.2	0.1	0.26	0.46	0.16667	0.54167
Luzumul	0	0	**0.75**	**1.75**	0.25	0.58333	0.16667	1	0.4	0.2	0.12	0.06	0.16667	0.54167
Trifolg	0	0	**0.75**	**0.375**	0.08333	0.04167	0.16667	0.08333	0	0	0.06	0.03	0	0

TABLE 4 *Continued*

	c51 Oak-Dicr sco-Plec con s.c. n=3		c35b Oak-Cama qua-Dode hen s.c. n=4		c37a Oak-Cama qua: typic n=12		c37b Oak-Cama qua-Ranu occ s.c. n=6		c37a Oak-Cama qua-Eryt ore s.c. n=5		c36 Oak-Cama lei n=50		c48 Oak-Mont per n=12	
Plant species*	Pres**	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov
MahoaquB2	0.33333	0.16667	**0.75**	**0.375**	0.58333	4.04167	0.16667	1	**0.8**	**2.6**	0.54	2.86	0.25	1.5
Camaqua	0	0	**1**	**19.625**	**1**	**22.4167**	**1**	**25.0833**	**1**	**22.2**	0.22	1.82	0.33333	2.54167
Ranuocc	0	0	0	0	0.16667	0.08333	**1**	**21.3333**	0.4	1.3	0.36	0.62	0.25	0.58333
Totals for the plant communities														
Total cover		789.5		770.5		2395.5		1217		962		11280.5		3087
Dominant cover		656.5		525.5		585.5		416		403.5		4155.5		1223
Dom/tot cover		**0.83154**		**0.68202**		**0.24442**		**0.34182**		**0.41944**		**0.36838**		**0.39618**
Tree layer species with ≥ 0.70 in at least one community														
QuergarA	**1**	**34.6667**	**0.75**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**0.6**	**31.4**	**0.22**	**2.54**	**0.5**	**23.1667**
QuergarB1	**1**	**24**	**1**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**0.6**	**28**	**0.78**	**5.36**	**0.91667**	**25.3333**
QuergarB2	**0.66667**	**4**	**0.25**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**0.6**	**22.4**	**0.78**	**5.78**	**0.66667**	**3.625**
QuergarD	**1**	**2.33333**	**1**	**1.625**	**[illegible]**	**0.75**	**0**	**0**	**0.6**	**1.4**	**0.76**	**2.42**	**0.91667**	**5.29167**
PseumenA	0	0	0.75	4.5	0.25	4.16667	0	0	0.4	2.4	0.18	2.92	0.16667	3
PseumenB1	0	0	0	0	0	0	0	0	0	0	0.06	0.36	0.16667	1
PseumenB2	0	0	0	0	0	0	0	0	0.2	3.6	0.02	0.12	0.16667	0.54167
PseumenD	0	0	0.25	0.125	0	0	0.16667	0.08333	0	0	0.02	0.01	0.25	0.125

TABLE 4 *Continued*

	c51 Oak-Dicr sco-Plec con s.c. n=3		c35b Oak-Cama qua-Dode hen s.c. n=4		c37a Oak-Cama qua: typic n=12		c37b Oak-Cama qua-Ranu occ s.c. n=6		c37a Oak-Cama qua-Eryt ore s.c. n=5		c36 Oak-Cama lei n=50		c48 Oak-Mont per n=12	
Plant species*	Pres**	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov
MahoaquB2	0.33333	0.16667	**0.75**	**0.375**	0.58333	4.04167	0.16667	1	**0.8**	**2.6**	0.54	2.86	0.25	1.5
Camaqua	0	0	**1**	**10.625**	**1**	**22.4167**	**1**	**23.0833**	**1**	**22.2**	0.22	1.82	0.33333	2.54167
Ranuocc	0	0	0	0	0.16667	0.08333	**1**	**21.3333**	0.4	1.3	0.36	0.62	0.25	0.58333
Totals for the plant communities														
Total cover		789.5		770.5		2395.5		1217		962		11280.5		3087
Dominant cover		656.5		525.5		585.5		416		403.5		4155.5		1223
Dom/tot cover		**0.83154**		**0.68202**		**0.24442**		**0.34182**		**0.41944**		**0.36838**		**0.39618**
Tree layer species with ≥ 0.70 in at least one community														
QuergarA	**1**	**54.6667**	**0.75**	**10.5**	**0.83333**	**48.3333**	**0.83333**	**48.3333**	**0.6**	**31.4**	**0.72**	**32.94**	**0.5**	**23.1667**
QuergarB1	**1**	**14**	**1**	**12**	**0.83333**	**21.4167**	**0.5**	**13.6667**	**0.8**	**29**	**0.8**	**30.48**	**0.91667**	**25.3333**
QuergarB2	**0.66667**	**4**	**0.25**	**1.8**	**0.75**	**5.04167**	**0.83333**	**3.16667**	**0.6**	**12.4**	**0.78**	**9.73**	**0.66667**	**3.625**
QuergarD	**1**	**2.33333**	**1**	**1.875**	**0.58333**	**0.75**	**0**	**0**	**0.6**	**1.4**	**0.76**	**2.42**	**0.91667**	**5.29167**
PseumenA	0	0	0.75	4.5	0.25	4.16667	0	0	0.4	2.4	0.18	2.92	0.16667	3
PseumenB1	0	0	0	0	0	0	0	0	0	0	0.06	0.36	0.16667	1
PseumenB2	0	0	0	0	0	0	0	0	0.2	3.6	0.02	0.12	0.16667	0.54167
PseumenD	0	0	0.25	0.125	0	0	0.16667	0.08333	0	0	0.02	0.01	0.25	0.125

TABLE 5 *Short version of presence and cover for native bedrock outcrop and associated plant communities*

	c11 Oak-Dicr sco-Mont par s.c. n=7		c52 Oak-Disc sco: typic n=4		c45 Oak-Disc sco-Sedu spa s.c. n=5		c46 Oak-(Fd)-Rhac can-Sela wal s.c. n=4		c26 Oak-Maho aqu n=4		c16a Oak-Loni his n=9	
Plant species*	Pres**	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov
	Bedrock outcrops								**Other communities**			
Montpar	**1**	**28.5**	0	0	0.2	1.2	0	0	0	0	0	0
Airapra	**0.857**	**7.25**	0.5	6	0.4	1.3	**0.75**	**1.75**	0	0	0.11111	0.66667
Anthodo	**0.714**	**14.33**	**0.75**	**11.13**	0.2	0.1	0.25	0.125	0.25	1.5	0.33333	4.33333
Montper	**0.714**	**14.33**	0.25	1.5	0.2	0.1	0.25	0.125	0.25	0.125	0.22222	0.72222
Polygly	**0.857**	**4.167**	0.25	0.125	0.6	1.4	0	0	0	0	0	0
Rhyttri	**0.714**	**21.83**	0	0	0.2	1.2	0	0	0.25	1.5	0	0
Bromcar	**0.714**	**3.167**	0.25	0.125	0.6	2.5	**1**	**4.625**	**1**	**3.25**	0.66667	6.66667
Elymgla	**1**	**11.17**	**0.75**	**6.125**	0.6	1.4	**1**	**3.25**	**1**	**10.63**	**0.889**	**9.611**
Galiapa	**1**	**11.17**	**0.75**	**1.75**	**0.8**	**3.7**	0.5	1.625	**0.75**	**6.125**	**0.889**	**10.06**
SympalbB2	**0.714**	**8.5**	**0.75**	**6.125**	**1**	**12.1**	0.25	0.125	0.5	11	0.44444	6.94444
Dicrsco	**0.857**	**23.5**	**1**	**5**	**0.8**	**16**	0.25	1.5	0.25	1.5	0.33333	2
Lotumic	0	0	**0.75**	**3.125**	0.4	0.2	**0.75**	**3.125**	0.25	0.125	0.11111	0.66667
Rhaccan	**0.143**	**1**	**0.75**	**10.5**	0.4	2.4	**0.75**	**29.75**	0.5	3	0.11111	0.66667
Festidah	**0.143**	**1**	**0.75**	**3.125**	0.6	3.8	0.5	3	0.5	0.25	0.33333	1.38889
Festbro	0.57143	3.25	**0.75**	**15.5**	0.6	4.9	**0.75**	**4.75**	0.5	6	0.33333	3.33333
Lonihis	0.14286	3	**0.75**	**4.5**	0.4	4.8	0.5	6	0	0	**1**	**34.67**
Seduspa	0.42857	4.08333	0.5	1.625	**1**	**22**	0.25	1.5	0.5	0.25	0.11111	0.66667
Selawal	0.42857	0.25	0.5	1.625	0.4	4.8	**1**	**25**	0.25	1.5	0.44444	0.83333

* Species are designated by the first 4 letters of the genus followed by the first 3 letters of the species.

** Mean presence and average cover for shrubs, herbs, and moss layer species with a presence ≥ 0.70 in at least one community.

Species used in naming.

Species with ≥ 0.70 presence cover.

TABLE 5 *Short version of presence and cover for native bedrock outcrop and associated plant communities*

	c11 Oak-Dicr sco-Mont par s.c. n=7		c52 Oak-Disc sco: typic n=4		c45 Oak-Disc sco-Sedu spa s.c. n=5		c46 Oak-(Fd)-Rhac can-Sela wal s.c. n=4		c26 Oak-Maho aqu n=4		c16a Oak-Loni his n=9	
Plant species*	Pres**	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov
	Bedrock outcrops								**Other communities**			
Montpar	**1**	**28.5**	0	0	0.2	1.2	0	0	0	0	0	0
Airapra	**0.857**	**7.25**	0.5	6	0.4	1.3	**0.75**	**1.75**	0	0	0.11111	0.66667
Anthodo	**0.714**	**14.33**	**0.75**	**11.13**	0.2	0.1	0.25	0.125	0.25	1.5	0.33333	4.33333
Montper	**0.714**	**14.33**	0.25	1.5	0.2	0.1	0.25	0.125	0.25	0.125	0.22222	0.72222
Polygly	**0.857**	**4.167**	0.25	0.125	0.6	1.4	0	0	0	0	0	0
Rhyttri	**0.714**	**21.83**	0	0	0.2	1.2	0	0	0.25	1.5	0	0
Bromcar	**0.714**	**3.167**	0.25	0.125	0.6	2.5	**1**	**4.625**	**1**	**3.25**	0.66667	6.66667
Elymgla	**1**	**11.17**	**0.75**	**6.125**	0.6	1.4	**1**	**3.25**	**1**	**10.63**	**0.889**	**9.611**
Galiapa	**1**	**11.17**	**0.75**	**1.75**	**0.8**	**3.7**	0.5	1.625	**0.75**	**6.125**	**0.889**	**10.06**
SympalbB2	**0.714**	**8.5**	**0.75**	**6.125**	**1**	**12.1**	0.25	0.125	0.5	11	0.44444	6.94444
Diersco	**0.857**	**23.5**	**1**	**28**	**0.8**	**16**	0.25	1.5	0.25	1.5	0.33333	2
Lotumic	0	0	**0.75**	**3.125**	0.4	0.2	**0.75**	**3.125**	0.25	0.125	0.11111	0.66667
Rhaccan	0.143	1	**0.75**	**10.5**	0.4	2.4	**0.75**	**29.75**	0.5	3	0.11111	0.66667
Festidah	0.143	1	**0.75**	**3.125**	0.6	3.8	0.5	3	0.5	0.25	0.33333	1.38889
Festbro	0.57143	3.25	**0.75**	**15.5**	0.6	4.9	**0.75**	**4.75**	0.5	6	0.33333	3.33333
Lonihis	0.14286	3	**0.75**	**4.5**	0.4	4.8	0.5	6	0	0	**1**	**34.67**
Seduspa	0.42857	4.08333	0.5	1.625	**1**	**22**	0.25	1.5	0.5	0.25	0.11111	0.66667
Selawal	0.42857	0.25	0.5	1.625	0.4	4.8	**1**	**25**	0.25	1.5	0.44444	0.83333

* Species are designated by the first 4 letters of the genus followed by the first 3 letters of the species.

** Mean presence and average cover for shrubs, herbs, and moss layer species with a presence ≥ 0.70 in at least one community.

bold Species used in naming.

bold Species with ≥ 0.70 presence cover.

TABLE 5 *Continued*

	c11 Oak-Dicr sco-Mont par s.c. n=7		c52 Oak-Disc sco: typic n=4		c45 Oak-Disc sco-Sedu spa s.c. n=5		c46 Oak-(Fd)-Rhac can-Sela wal s.c. n=4		c26 Oak-Maho aqu n=4		c16a Oak-Loni his n=9	
Plant species*	Pres**	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov
Luzumul	0.57143	1.25	0	0	0.4	0.2	**0.75**	**4.75**	0.25	0.125	0.33333	2.11111
Polyjun	0.57143	6	0.5	3	0.4	2.4	**0.75**	**10.5**	0	0	0	0
Collpar	0.28571	1.08333	0.5	3	0.2	0.1	**0.75**	**3.125**	0	0	0.11111	0.05556
Crepis	0	0	0	0	0.2	0.1	**0.75**	**0.375**	0	0	0.33333	0.16667
Eriolan	0	0	0	0	0	0	**0.75**	**1.75**	0.5	1.625	0.11111	0.05556
Pitytri	0	0	0	0	0	0	**0.75**	**0.375**	0	0	0.11111	0.05556
Achimil	0.28571	2	0	0	0.2	0.1	**0.75**	**3.125**	**0.75**	**7.5**	0.55556	2.22222
Rumeace	0.57143	4.16667	0.5	0.25	0.4	0.2	**0.75**	**0.375**	0.25	1.5	0.22222	0.11111
Ceraarv	0.28571	1.08333	0.25	0.125	0.6	0.3	0.5	4.625	**0.75**	**7.5**	0.55556	3.44444
Sanicra	0.28571	4	0.25	0.125	0.6	2.5	0.25	0.125	**0.75**	**9.125**	**0.889**	**4.222**
Bromste	0.28571	0.16667	0.25	0.125	0.4	4.8	0.5	14	**1**	**10.63**	0.66667	5.72222
Cynoech	0.14286	0.08333	0.5	1.625	0.4	0.2	0.25	4.5	**0.75**	**11.13**	0.44444	2.77778
MahoaquB2	0.42857	2.08333	0.5	0.25	0.6	4.9	0.25	0.125	[illegible]	[illegible]	0.22222	1.33333
Vicisat	0.28571	1.08333	0.25	4.5	0.2	0.1	0	0	**1**	**4.625**	**0.889**	**10.94**
Vicihir	0.28571	2	0.5	1.625	0.4	1.3	0	0	0.5	6	**0.778**	**4.778**
Poa pra	0.28571	2	0.5	1.625	0.6	0.3	0	0	0.5	3	0.55556	2.83333
Hyporad	0.57143	1.25	0.5	0.25	0.4	0.2	0.25	0.125	0.25	4.5	0.33333	0.16667
Trifolg	0	0	0	0	0.2	0.1	0.25	0.125	0	0	0.11111	0.05556
Trifmcc	0	0	0	0	0	0	0	0	0	0	0.22222	2.66667
Airacar	0.14286	0.08333	0	0	0.4	0.2	0.5	0.25	0	0	0.11111	0.05556
Careino	0.14286	3	0.25	4.5	0.2	3.6	0.5	9	0.5	4.625	0.33333	3.33333
Camalei	0.42857	2.08333	0.25	1.5	0.6	1.4	0	0	0.5	1.625	0.33333	2.72222
Viciame	0.14286	0.08333	0	0	0.2	1.2	0.25	1.5	0.25	1.5	0.33333	1.38889
Dactglo	0.57143	3.08333	0.5	6	0.2	0.1	0	0	0.5	6	0.44444	0.83333
Planlan	0.14286	0.08333	0.25	0.125	0	0	0	0	0.5	0.25	0.33333	2

TABLE 5 *Continued*

	c11 Oak-Dicr sco-Mont par s.c. n=7		c52 Oak-Disc sco: typic n=4		c45 Oak-Disc sco-Sedu spa s.c. n=5		c46 Oak-(Fd)-Rhac can-Sela wal s.c. n=4		c26 Oak-Maho aqu n=4		c16a Oak-Loni his n=9	
Plant species*	Pres**	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov
Luzumul	0.57143	1.25	0	0	0.4	0.2	**0.75**	**4.75**	0.25	0.125	0.33333	2.11111
Polyjun	0.57143	6	0.5	3	0.4	2.4	**0.75**	**10.5**	0	0	0	0
Collpar	0.28571	1.08333	0.5	3	0.2	0.1	**0.75**	**3.125**	0	0	0.11111	0.05556
Crepis	0	0	0	0	0.2	0.1	**0.75**	**0.375**	0	0	0.33333	0.16667
Eriolan	0	0	0	0	0	0	**0.75**	**1.75**	0.5	1.625	0.11111	0.05556
Pityvri	0	0	0	0	0	0	**0.75**	**0.375**	0	0	0.11111	0.05556
Achimil	0.28571	2	0	0	0.2	0.1	**0.75**	**3.125**	**0.75**	**7.5**	0.55556	2.22222
Rumeace	0.57143	4.16667	0.5	0.25	0.4	0.2	**0.75**	**0.375**	0.25	1.5	0.22222	0.11111
Ceraarv	0.28571	1.08333	0.25	0.125	0.6	0.3	0.5	4.625	**0.75**	**7.5**	0.55556	3.44444
Saniera	0.28571	4	0.25	0.125	0.6	2.5	0.25	0.125	**0.75**	**9.125**	**0.889**	**4.222**
Bromste	0.28571	0.16667	0.25	0.125	0.4	4.8	0.5	14	**1**	**10.63**	0.66667	5.72222
Cynoech	0.14286	0.08333	0.5	1.625	0.4	0.2	0.25	4.5	**0.75**	**11.13**	0.44444	2.77778
MahoaquB2	0.42857	2.08333	0.5	0.25	0.6	4.9	0.25	0.125	**1**	**28**	0.22222	1.33333
Vicisat	0.28571	1.08333	0.25	4.5	0.2	0.1	0	0	**1**	**4.625**	**0.889**	**10.94**
Vicihir	0.28571	2	0.5	1.625	0.4	1.3	0	0	0.5	6	**0.778**	**4.778**
Posa pra	0.28571	2	0.5	1.625	0.6	0.3	0	0	0.5	3	0.55556	2.83333
Hyporad	0.57143	1.25	0.5	0.25	0.4	0.2	0.25	0.125	0.25	4.5	0.33333	0.16667
Trifolg	0	0	0	0	0.2	0.1	0.25	0.125	0	0	0.11111	0.05556
Trifmcc	0	0	0	0	0	0	0	0	0	0	0.22222	2.66667
Airacar	0.14286	0.08333	0	0	0.4	0.2	0.5	0.25	0	0	0.11111	0.05556
Careino	0.14286	3	0.25	4.5	0.2	3.6	0.5	9	0.5	4.625	0.33333	3.33333
Camalei	0.42857	2.08333	0.25	1.5	0.6	1.4	0	0	0.5	1.625	0.33333	2.72222
Viciame	0.14286	0.08333	0	0	0.2	1.2	0.25	1.5	0.25	1.5	0.33333	1.38889
Dactglo	0.57143	3.08333	0.5	6	0.2	0.1	0	0	0.5	6	0.44444	0.83333
Planlan	0.14286	0.08333	0.25	0.125	0	0	0	0	0.5	0.25	0.33333	2

TABLE 5 *Continued*

	c11 Oak-Dicr sco-Mont par s.c. n=7		c52 Oak-Disc sco: typic n=4		c45 Oak-Disc sco-Sedu spa s.c. n=5		c46 Oak-(Fd)-Rhac can-Sela wal s.c. n=4		c26 Oak-Maho aqu n=4		c16a Oak-Loni his n=9	
Plant species*	Pres**	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov
Lathnev	0.14286	0.08333	0.25	0.125	0.4	3.7	0	0	0	0	0	0
Ranuocc	0.14286	1	0.25	4.5	0	0	0	0	0.25	0.125	0.33333	0.77778
Dantcal	0.14286	0.08333	0	0	0	0	0	0	0.25	1.5	0.22222	1.33333
Melisub	0.28571	4	0.25	0.125	0.6	7.3	0	0	0.25	4.5	0.44444	2.77778
HolodisB2	0.14286	0.08333	0.5	4.625	0.6	17.4	0	0	0	0	0.33333	3.33333
HolodisB1	0.28571	11.5	0.25	1.5	0.2	3.6	0	0	0.25	4.5	0.33333	1.38889
CytiscoB2	0.57143	0.33333	0.5	1.625	0.2	0.1	0.5	4.625	0.5	6	0.22222	0.72222
Arenmac	0.42857	3.16667	0	0	0	0	0	0	0	0	0.11111	0.05556
Stelmed	0.28571	0.16667	0.25	1.5	0.2	0.1	0.25	0.125	0	0	0.33333	0.77778
Erytore	0.42857	3.16667	0.25	0.125	0.4	0.2	0	0	0	0	0.11111	0.05556
Fritlan	0.14286	0.08333	0.25	0.125	0	0	0	0	0.25	0.125	0.22222	0.72222
Lonicil	0.14286	0.08333	0.25	0.125	0.2	1.2	0	0	0.25	0.125	0	0
Rossanut	0	0	0.25	1.5	0	0	0	0	0.25	1.5	0.11111	0.66667
OemlcerB2	0	0	0	0	0.2	0.1	0	0	0	0	0	0
Daphlau	0.14286	0.08333	0.25	4.5	0	0	0	0	0	0	0	0
Totals for the plant communities												
Total cover		1524.5		715		788.5		756		785		1773.5
Dominant cover		887.5		359.5		269		386.5		394		668.5
Dom/tot cover		**0.58216**		**0.5028**		**0.34115**		**0.51124**		**0.50191**		0.37694

TABLE 5 *Concluded*

	c11 Oak-Dicr sco-Mont par s.c. n=7		c52 Oak-Disc sco: typic n=4		c45 Oak-Disc sco-Sedu spa s.c. n=5		c46 Oak-(Fd)-Rhac can-Sela wal s.c. n=4		c26 Oak-Maho aqu n=4		c16a Oak-Loni his n=9	
Plant species*	Pres**	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov
Tree layer species with ≥ 0.70 in at least one community												
QuergarA	**0.571**	**13.33**	**0.75**	**37.25**	0	0	**0.75**	**33**	**0.75**	**56**	**0.556**	**32.22**
QuergarB1	**1**	**42.83**	**0.75**	**18.75**	**1**	**44**	**0.75**	**24.75**	**0.75**	**26.75**	**0.667**	**23.67**
QuergarB2	**0.571**	**8**	**1**	**7.625**	**1**	**31**	**0.75**	**6.125**	**1**	**9**	**0.889**	**14.72**
QuergarD	**0.857**	**2.333**	**0.5**	**1.625**	**0.8**	**4.6**	**1**	**3.25**	**1**	**3.25**	**0.778**	**3.556**
PseumenA	0.42857	5	0.25	4.5	0	0	**0.75**	**10.5**	0.25	4.5	0.66667	12.8889
PseumenB1	0.14286	1	0	0	0.2	1.2	**0.25**	**9.5**	0.25	1.5	0	0
PseumenB2	0.14286	0.08333	0	0	0.2	1.2	0.25	4.5	0.25	4.5	0.11111	2
PseumenD	0.28571	0.16667	0.25	0.125	0	0	0.25	0.125	0	0	0.11111	0.05556

TABLE 5 *Concluded*

	c11 Oak-Dicr sco-Mont par s.c. n=7		c52 Oak-Disc sco: typic n=4		c45 Oak-Disc sco-Sedu spa s.c. n=5		c46 Oak-(Fd)-Rhac can-Sela wal s.c. n=4		c26 Oak-Maho aqu n=4		c16a Oak-Loni his n=9	
Plant species*	Pres**	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov
Tree layer species with ≥ 0.70 in at least one community												
QuergarA	**0.571**	**13.33**	**0.75**	**47.25**	0	0	**0.75**	**33**	**0.75**	**36**	**0.556**	**32.22**
QuergarB1	**1**	**42.83**	**0.75**	**18.75**	**1**	**44**	**0.75**	**24.75**	**0.75**	**26.75**	**0.667**	**23.67**
QuergarB2	**0.571**	**8**	**1**	**7.625**	**1**	**31**	**0.75**	**6.125**	**1**	**9**	**0.889**	**14.72**
QuergarD	**0.857**	**2.333**	**0.5**	**1.625**	**0.8**	**2.6**	**1**	**3.25**	**1**	**3.25**	**0.778**	**3.556**
PseumenA	0.42857	5	0.25	4.5	0	0	**0.75**	**10.5**	0.25	4.5	0.66667	12.8889
PseumenB1	0.14286	1	0	0	0.2	1.2	**0.25**	**9.5**	0.25	1.5	0	0
PseumenB2	0.14286	0.08333	0	0	0.2	1.2	0.25	4.5	0.25	4.5	0.11111	2
PseumenD	0.28571	0.16667	0.25	0.125	0	0	0.25	0.125	0	0	0.11111	0.05556

TABLE 6 *Short version of presence and cover for other native plant communities (1)*

	c20 Oak-Fest ida: typic n=7		c25 Oak-Fest ida-Cera arv s.c. n=6		c27 Oak-Fest ida-Trif mic s.c. n=4		c42 Krum Oak-Fest ida-Vici ame s.c. n=6		c47 Oak-Elym gla n=14		c43 Oak-Brom car n=6		c41 Oak-Lath nev n=5		c14 Oak - Care ino n=6	
Plant species*	Pres**	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov
Montpar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Airapra	0.4285714	3.5	0.1666667	0.0833333	0.25	0.125	0.5	0.25	0.0714286	0.0357143	0.1666667	0.0833333	0	0	0.3333333	1.0833333
Anthodo	0.4285714	1.7857143	**0.8333333**	**11.416667**	0.5	6	0.5	7.4166667	0.2857143	0.9285714	0.5	3.1666667	0.4	8.8	0.5	5
Montper	0.1428571	0.8571429	0.5	1.1666667	0.25	0.125	0.3333333	1.0833333	0.3571429	1.3571429	0.5	4.0833333	0	0	0	0
Polygly	0.1428571	0.0714286	0.1666667	1	0	0	0	0	0.2142857	0.5	0	0	0	0	0	0
Rhyttri	0	0	0.1666667	1	0	0	0.3333333	4	0.2142857	2.1428571	0	0	0	0	0.1666667	1
Bromcar	**0.7142857**	**7.7142857**	**0.8333333**	**11**	**0.75**	**0.375**	**0.8333333**	**8.0833333**	0.5714286	1.0714286	**1**	**28.833333**	0.6	2.5	0.3333333	4
Elymgla	**0.8571429**	**11.214286**	**0.8333333**	**10.083333**	**1**	**1.875**	0.6666667	10	**1**	**28.571429**	**0.8333333**	**2.25**	0.2	3.6	**0.8333333**	**5**
Galiapa	**0.8571429**	**7**	**0.8333333**	**6.25**	**0.75**	**6.125**	**1**	**8.1666667**	**0.9285714**	**9.1428571**	**1**	**11.083333**	0.6	8.4	**0.8333333**	**7**
SympalbB2	0.4285714	1	0.5	2.0833333	0	0	**0.8333333**	**10.5**	0.6428571	16.75	0.5	12.333333	**0.8**	**21.5**	0.5	9.4166667
Dicrsco	0.4285714	6	0.5	5	0.5	3	0	0	0.0714286	0.4285714	0	0	0	0	0.6666667	6
Lotumic	0.1428571	2.5714286	0.3333333	3.0833333	0.5	3	0.1666667	0.0833333	0.1428571	0.4642857	0	0	0	0	0.6666667	3.0833333
Rhaccan	0.1428571	2.5714286	0.1666667	1	**0.75**	**7.5**	0.1666667	1	0.1428571	0.8571429	0	0	0	0	0.5	3
Festidah	**1**	**26.571429**	**1**	**17.333333**	**0.75**	**23.5**	**0.8333333**	**10.083333**	0.4285714	1.3928571	0.3333333	1.0833333	0	0	0.6666667	2.1666667
Festbro	0.4285714	6.3571429	0.5	2.0833333	0.5	1.625	0.5	2.0833333	0.5	1.4285714	**0.8333333**	**5.1666667**	**0.8**	**9**	0	0
Lonihis	**0.7142857**	**13.571429**	0.5	5	0.5	6	0.6666667	6.1666667	0.3571429	6.6071429	0.3333333	1.0833333	0	0	0.3333333	1.0833333
Seduspa	0.2857143	1.7142857	0.1666667	0.0833333	0.25	0.125	0.3333333	3.0833333	0	0	0	0	0	0	0	0
Selawal	0.2857143	0.9285714	0.3333333	3.0833333	**1**	**6.25**	0.1666667	0.0833333	0.2142857	0.1071429	0.1666667	0.0833333	0	0	0	0
Luzumul	0.5714286	3.5714286	0.3333333	1.0833333	0.5	3	0.5	1.1666667	0.1428571	0.4642857	0	0	0.2	0.1	0.5	1.1666667
Polyjun	0.2857143	1.7142857	0.1666667	1	0	0	0	0	0	0	0	0	0	0	0	0
Collpar	0.1428571	0.0714286	0.3333333	0.1666667	0.25	0.125	0	0	0	0	0.1666667	1	0	0	0.3333333	2

* Species are designated by the first 4 letters of the genus followed by the first 3 letters of the species.

** Mean presence and average cover for shrubs, herbs, and moss layer species with a presence ≥ 0.70 in at least one community.

Species used in naming.

Species with ≥ 0.70 presence cover.

TABLE 6 *Short version of presence and cover for other native plant communities (1)*

	c20 Oak-Fest ida: typic n=7		c25 Oak-Fest ida-Cera arv s.c. n=6		c27 Oak-Fest ida-Trif mic s.c. n=4		c42 Krum Oak-Fest ida-Vici ame s.c. n=6		c47 Oak-Elym gla n=14		c43 Oak-Brom car n=6		c41 Oak-Lath nev n=5		c14 Oak - Care ino n=6	
Plant species*	Pres**	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov
Montpar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Airapra	0.4285714	3.5	0.1666667	0.0833333	0.25	0.125	0.5	0.25	0.0714286	0.0357143	0.1666667	0.0833333	0	0	0.3333333	1.0833333
Anthodo	0.4285714	1.7857143	**0.8333333**	**11.416667**	0.5	6	0.5	7.4166667	0.2857143	0.9285714	0.5	3.1666667	0.4	8.8	0.5	5
Montper	0.1428571	0.8571429	0.5	1.1666667	0.25	0.125	0.3333333	1.0833333	0.3571429	1.3571429	0.5	4.0833333	0	0	0	0
Polygly	0.1428571	0.0714286	0.1666667	1	0	0	0	0	0.2142857	0.5	0	0	0	0	0	0
Rhyttri	0	0	0.1666667	1	0	0	0.3333333	4	0.2142857	2.1428571	0	0	0	0	0.1666667	1
Bromcar	**0.7142857**	**7.7142857**	**0.8333333**	**11**	**0.75**	**0.375**	**0.8333333**	**8.0833333**	0.5714286	1.0714286	**1**	**28.833333**	0.6	2.5	0.3333333	4
Elymgla	**0.8571429**	**11.214286**	**0.8333333**	**10.083333**	**1**	**1.875**	0.6666667	10	**1**	**28.571429**	**0.8333333**	**2.25**	0.2	3.6	**0.8333333**	**5**
Galiapa	**0.8571429**	**7**	**0.8333333**	**6.25**	**0.75**	**6.125**	**1**	**8.1666667**	**0.9285714**	**9.1428571**	**1**	**11.083333**	0.6	8.4	**0.8333333**	**7**
SympalbB2	0.4285714	1	0.5	2.0833333	0	0	**0.8333333**	**10.5**	0.6428571	16.75	0.5	12.333333	**0.8**	**21.5**	0.5	9.4166667
Dicrsco	0.4285714	6	0.5	5	0.5	3	0	0	0.0714286	0.4285714	0	0	0	0	0.6666667	6
Lotumic	0.1428571	2.5714286	0.3333333	3.0833333	0.5	3	0.1666667	0.0833333	0.1428571	0.4642857	0	0	0	0	0.6666667	3.0833333
Rhaccan	0.1428571	2.5714286	0.1666667	1	**0.75**	**7.5**	0.1666667	1	0.1428571	0.8571429	0	0	0	0	0.5	3
Festidah	**1**	**26.571429**	**1**	**17.333333**	**0.75**	**23.5**	**0.8333333**	**10.083333**	0.4285714	1.3928571	0.3333333	1.0833333	0	0	0.6666667	2.1666667
Festbro	0.4285714	6.3571429	0.5	2.0833333	0.5	1.625	0.5	2.0833333	0.5	1.4285714	**0.8333333**	**5.1666667**	**0.8**	**9**	0	0
Lonihis	**0.7142857**	**13.571429**	0.5	5	0.5	6	0.6666667	6.1666667	0.3571429	6.6071429	0.3333333	1.0833333	0	0	0.3333333	1.0833333
Seduspa	0.2857143	1.7142857	0.1666667	0.0833333	0.25	0.125	0.3333333	3.0833333	0	0	0	0	0	0	0	0
Selawal	0.2857143	0.9285714	0.3333333	3.0833333	**1**	**6.25**	0.1666667	0.0833333	0.2142857	0.1071429	0.1666667	0.0833333	0	0	0	0
Luzumul	0.5714286	3.5714286	0.3333333	1.0833333	0.5	3	0.5	1.1666667	0.1428571	0.4642857	0	0	0.2	0.1	0.5	1.1666667
Polyjun	0.2857143	1.7142857	0.1666667	1	0	0	0	0	0	0	0	0	0	0	0	0
Collpar	0.1428571	0.0714286	0.3333333	0.1666667	0.25	0.125	0	0	0	0	0.1666667	1	0	0	0.3333333	2

* Species are designated by the first 4 letters of the genus followed by the first 3 letters of the species.

** Mean presence and average cover for shrubs, herbs, and moss layer species with a presence ≥ 0.70 in at least one community.

Species used in naming.

Species with ≥ 0.70 presence cover.

Table 6 *Continued*

	c20 Oak-Fest ida: typic n=4		c25 Oak-Fest ida-Cera arv s.c. n=6		c27 Oak-Fest ida-Trif mic s.c. n=4		c42 Krum Oak-Fest ida-Vici ame s.c. n=6		c47 Oak-Elym gla n=14		c43 Oak-Brom car n=6		c41 Oak-Lath nev n=5		c14 Oak-Care ino n=6	
Plant species	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov
	0.1428571	0.0714286	0.1666667	0.0833333	0.25	0.125	0	0	0.1428571	0.0714286	0	0	0	0	0	0
	0	0	0.3333333	1.0833333	0.25	0.125	0	0	0.2857143	0.1428571	0	0	0	0	0.1666667	0.0833333
	0.1428571	0.0714286	0.1666667	0.0833333	0.5	0.25	0	0	0.0714286	0.0357143	0	0	0	0	0	0
	0.4285714	0	**1**	**5.25**	0.5	6	0.6666667	2.1666667	0.3571429	1.8214286	0.6666667	1.25	0.2	0.1	0.3333333	0.1666667
	0.5714286	1.8571429	**0.8333333**	**0.4166667**	**0.75**	**1.75**	0.3333333	0.1666667	0.4285714	0.2142857	0	0	0	0	**0.8333333**	**1.3333333**
	0.8571429	**3.5714286**	**1**	**21.333333**	**1**	**6.25**	**1**	**2.3333333**	0.6428571	3.6428571	0.6666667	2.1666667	0	0	0.5	5
	1	**10.5**	0.3333333	4	0.5	3	**0.8333333**	**6.0833333**	**0.9285714**	**6.5**	0.6666667	8	**1**	**4.9**	0.6666667	4
	0.4285714	2.5714286	0.1666667	1	**0.75**	**20.5**	0.6666667	4.1666667	0.6428571	3.4285714	**0.8333333**	**10.583333**	**0.8**	**8.5**	0.5	1.1666667
	0.4285714	0.0714286	0.3333333	1.0833333	0.25	9.5	0.5	4.0833333	0.6428571	3.6071429	0.5	2.0833333	0.2	0.1	0.5	9.4166667
	0.1428571	0.8571429	0.3333333	1.0833333	0.25	0.125	0.6666667	2.1666667	0.3571429	2.2142857	0.5	5	0.6	1.4	0.5	1.1666667
	0.5714286	2.8571429	0.8333333	6.0833333	0.5	1.625	**1**	**7.0833333**	0.6428571	4.3928571	**1**	**10.583333**	**0.8**	**8.5**	**1**	**3.25**
	0.4285714	0.7142857	0.5	5	0	0	0.1666667	3	0.3571429	1.8928571	0.6666667	4	0.6	7.3	**0.8333333**	**6.25**
	0.7142857	**0.4285714**	0.5	7	0.5	3	**0.8333333**	**7.1666667**	0.6428571	7.0714286	0.6666667	4.1666667	**0.8**	**6.1**	0.5	4.0833333
	0.7142857	**0.3571429**	0.3333333	0.1666667	**0.75**	**6.125**	0.5	0.25	0.1428571	0.0714286	0.1666667	0.0833333	0.4	0.2	0.6666667	0.3333333
	0.1428571	0.0714286	0.1666667	0.0833333	**0.75**	**1.75**	0	0	0.2142857	0.1071429	0	0	0	0	0.3333333	1.0833333
	0.1428571	0.0714286	0	0	**1**	**23**	0	0	0.1428571	0.0714286	0	0	0	0	0.1666667	0.0833333
	0.1428571	0.8571429	0.3333333	0.1666667	**0.75**	**3.125**	0.3333333	1.0833333	0.2142857	0.1071429	0.3333333	1.0833333	0	0	0.1666667	0.0833333
	0.2857143	1.7142857	0.5	5	**0.75**	**18.5**	0.1666667	0.0833333	**0.7142857**	**10.642857**	0	0	0.4	0.2	**1**	**43**
	0.1428571	2.5714286	0.1666667	3	0	0	**0.8333333**	**3.1666667**	0.5	6.0357143	**1**	**9.0833333**	**0.8**	**20**	0.1666667	1
	0.2857143	1.5	0.1666667	3	0	0	**1**	**15.333333**	0.3571429	3.4642857	0.5	4.0833333	0.2	3.6	0.1666667	1
	0.4285714	1.5	0.3333333	0.1666667	0.25	0.125	0.5	19.833333	0.2142857	1.2857143	0.5	4.0833333	**1**	**19.6**	0.3333333	2
	0.5714286	1.8571429	0.5	4.0833333	0	0	0.6666667	1.25	0.1428571	0.0714286	0.5	0.25	**0.8**	**7.4**	0.6666667	0.3333333
	0.2857143	0.1428571	0	0	0	0	0	0	0.2142857	0.8928571	0.1666667	1	**1**	**20**	0.1666667	3
	0.4285714	1	0.5	2.0833333	0.25	4.5	0.3333333	1.0833333	0.4285714	1	0.3333333	2	0.2	1.2	**0.8333333**	**4.0833333**
	0.1428571	0.0714286	0.1666667	1	0.25	0.125	0.1666667	0.0833333	0.2857143	5	0	0	0	0	**0.8333333**	**2.25**
	0.2857143	0.9285714	0.1666667	0.0833333	0.25	1.5	0.5	1.1666667	0.5714286	6.4642857	0.1666667	0.0833333	0.2	1.2	0.5	2.0833333
	0.1428571	0.0714286	0.1666667	1	0	0	0.3333333	1.0833333	0.2142857	2.1428571	0.6666667	4	0.2	1.2	0.3333333	1.0833333
	0.1428571	2.5714286	0	0	0	0	0.3333333	6	0.2857143	3.4285714	0.1666667	3	0.2	7.6	0.3333333	7.3333333

Continued

	c25 Oak- Festuca- Cerastium s.c. n=6		c27 Oak- Festuca- Trifolium s.c. n=4		c42 Krum Oak- Festuca- Viola ame s.c. n=6		c47 Oak- Hym gla n=14		c43 Oak- Brom car n=6		c41 Oak- Lath nev n=5		c14 Oak - Carex ino n=6	
	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov
	0.1666667	0.0833333	0.25	0.12	0	0	0.1428571	0.0714286	0	0	0	0	0	0
	0.3333333	1.0833333	0.25	0.12	0	0	0.2857143	0.1428571	0	0	0	0	0.1666667	0.0833333
	0.1666667	0.0833333	0.5	0.25	0	0	0.0714286	0.0357143	0	0	0	0	0	0
	1	**5.25**	0.5	6	0.6666667	2.1666667	0.3571429	1.8214286	0.6666667	1.25	0.2	0.1	0.3333333	0.1666667
	0.8333333	**0.4166667**	**0.75**	**1.75**	0.3333333	0.1666667	0.4285714	0.2142857	0	0	0	0	**0.8333333**	**1.3333333**
	1	**21.333333**	**1**	**6.25**	**1**	**2.3333333**	0.6428571	3.6428571	0.6666667	2.1666667	0	0	0.5	5
	0.3333333	1	0.5	3	**0.8333333**	**6.0833333**	**0.9285714**	**6.5**	0.6666667	8	**1**	**4.9**	0.6666667	4
	0.3333333	1	**0.75**	**20.5**	0.6666667	1.1666667	0.6428571	3.4285714	**0.8333333**	**10.083333**	**0.8**	**8.5**	0.5	1.1666667
	0.3333333	1.0833333	0.25	9.5	0.5	1.0833333	0.6428571	3.6071429	0.5	2.0833333	0.2	0.1	0.5	9.4166667
	0.3333333	1.0833333	0.25	0.125	0.6666667	2.1666667	0.3571429	2.2142857	0.5	5	0.6	1.4	0.5	1.1666667
	0.8333333	6.0833333	0.5	1.625	**1**	**7.0833333**	0.6428571	4.3928571	**1**	**18.583333**	**0.8**	**8.5**	**1**	**3.25**
	0.5	5	0	0	0.1666667	3	0.3571429	1.8928571	0.6666667	4	0.6	7.3	**0.8333333**	**6.25**
	0.5	3	0.5	3	**0.8333333**	**7.1666667**	0.6428571	3.7071429	0.6666667	**4.1666667**	**0.8**	**6.1**	0.5	4.0833333
	0.1666667	0.0833333	**0.75**	**6.125**	0.5	0.25	0.1428571	0.0714286	0.1666667	0.0833333	0.4	0.2	0.6666667	0.3333333
	0.1666667	0.0833333	**0.75**	**1.75**	0	0	0.2142857	0.1071429	0	0	0	0	0.3333333	1.0833333
	0	0	**1**	**23**	0	0	0.1428571	0.0714286	0	0	0	0	0.1666667	0.0833333
	0.1666667	0.0833333	**0.75**	**3.125**	0.3333333	1.0833333	0.2142857	0.1071429	0.3333333	1.0833333	0	0	0.1666667	0.0833333
	0.5	3	**0.75**	**18.5**	0.1666667	0.0833333	**0.7142857**	**10.642857**	0	0	0.4	0.2	**1**	**43**
	0.5	3	0	0	**0.8333333**	**3.1666667**	0.5	6.0357143	**1**	**9.0833333**	**0.8**	**20**	0.1666667	1
	0.1666667	0.0833333	0	0	**1**	**15.333333**	0.3571429	3.4642857	0.5	4.0833333	0.2	3.6	0.1666667	1
	0.1666667	0.0833333	0	0	0.5	1.9583333	0.2142857	1.2857143	0.5	4.0833333	**1**	**19.6**	0.3333333	2
	0.3333333	1.0833333	0.25	0.125	0.1666667	1.2	0.1428571	0.0714286	0.5	0.25	**0.8**	**7.4**	0.6666667	0.3333333
	0.1666667	1.0833333	0	0	0	0	0.2142857	0.8928571	0.1666667	1	**1**	**26**	0.1666667	3
	0.5	2.0833333	0.25	4.5	0.3333333	1.0833333	0.4285714	1	0.3333333	2	0.2	1.2	**0.8333333**	**4.0833333**
	0.1666667	0.0833333	0.25	0.125	0.1666667	0.0833333	0.2857143	5	0	0	0	0	**0.8333333**	**2.25**
	0.1666667	1	0.25	1.5	0.5	1.1666667	0.5714286	6.4642857	0.1666667	0.0833333	0.2	1.2	0.5	2.0833333
	0.1666667	1	0	0	0.3333333	1.0833333	0.2142857	2.2428571	0.6666667	4	0.2	1.2	0.3333333	1.0833333
	0	0	0	0	0.3333333	6	0.2857143	3.4285714	0.1666667	3	0.2	7.6	0.3333333	7.3333333

TABLE 6 *Concluded*

	c26 Oak-Fest ida typic n=7		c25 Oak-Fest ida-Cera arv s.c. n=6		c27 Oak-Fest ida-Trif mic s.c. n=4		c42 Krum Oak-Fest ida-Vici ame s.c. n=6		c47 Oak-Elym gla n=14		c43 Oak-Brom car n=6		c41 Oak-Lath nev n=5		c14 Oak-Care ino n=6	
Plant species*	Pres**	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov
CelticoB2	0.1428571	0.0714286	0.6666667	8	0.25	1.5	0.1666667	1	0.5714286	3.0357143	0.3333333	3.0833333	0.4	2.4	0.1666667	0.0833333
Arcminac	0.1428571	0.0714286	0	0	0	0	0	0	0.0714286	1.2857143	0	0	0	0	0	0
Stelmed	0.2857143	0.1428571	0.3333333	0.1666667	0.25	0.125	0.1666667	0.0833333	0.3571429	1.4285714	0.5	1.1666667	0.4	0.2	0.3333333	0.1666667
Erybore	0	0	0	0	0	0	0.5	0.25	0.2142857	0.1071429	0	0	0.6	8.9	0.3333333	3.0833333
Fritlan	0.2857143	0.1428571	0.5	0.25	0	0	0.5	1.1666667	0.1428571	0.0714286	0	0	0.2	0.1	0.5	3.1666667
Lomcal	0	0	0	0	0	0	0.3333333	0.1666667	0	0	0	0	0	0	0.1666667	1
Rossamu	0.1428571	0.0714286	0	0	0	0	0.3333333	1.0833333	0.0714286	1.2857143	0	0	0.4	2.4	0.1666667	3
OsmlcerB1	0	0	0	0	0	0	0	0	0.0714286	0.0357143	0.1666667	1	0	0	0	0
OsmlcerB2	0	0	0	0	0	0	0	0	0	0	0.1666667	3	0.2	0.1	0	0
Osphlau	0	0	0	0	0	0	0	0	0.2142857	1.75	0	0	0.4	2.4	0.1666667	0.0833333
Totals for the plant communities																
Total cover		1350.5		1151.5		622		1191		2827.5		1194		1287.5		1259
Dominant cover		556		503.5		306.5		408		768		510.5		657.5		433
Dom/tot cover		0.4116994		0.4372558		0.61618		0.3929471		0.271618		0.4275544		0.5106796		0.3439237
Tree layer species with ≥ 0.1 m in at least one community																
QuergarA	0.7142857	48.571429	0.5	17.833333	1	56.75	0.5	24	0.7142857	40	0.3333333	16.833333	1	60	0.6333333	52.5
QuergarB1	0.8571429	16	0.8333333	47.166667	0.25	1.5	0.6666667	19.5	0.7142857	32.357143	1	5.5	0.8	13.6	0.5	12.333333
QuergarB2	0.8571429	13.142857	0.6666667	3.0833333	0.5	1.625	1	54.333333	0.6428571	6.8928571	1	0.5	0.4	7.2	0.3333333	9.3333333
QuergarD	0.8571429	3.7142857	0.5	1.1666667	0.5	0.25	0.8333333	11.416667	0.7857143	2.8214286	0.8333333	0.0833333	0.8	1.2	0.1666667	1.25
PseumenA	0.4285714	8.8571429	0.1666667	3	0.5	3	0.3333333	2	0.2857143	8	0.1666667	3	0.2	7.6	0.3333333	4
PseumenB1	0.1428571	0.8571429	0	0	0	0	0.1666667	1	0.0714286	0.4285714	0	0	0	0	0	0
PseumenB2	0.1428571	0.8571429	0.1666667	3	0.5	3	0.1666667	1	0.1428571	0.4642857	0	0	0	0	0.1666667	3
PseumenD	0.2857143	0.1428571	0.1666667	0.0833333	0.75	0.375	0.1666667	0.0833333	0.2857143	0.1428571	0	0	0	0	0.1666667	0.0833333

Table 6. Continued.

	c20		c23		c27		c32											
	Oak		Oak		Oak		Kroom Oak		c47		c43		c41		c14			
	Lest id		Lest ida		Lest ida		Lest ida		Oak		Oak		Oak		Oak			
	Typic		Cerastiu		Trif rep		Vicia ame		Elym gla		Brom car		Lath nev		Carex ino			
	n=7		n=9		n=4		n=9		n=14		n=6		n=5		n=6			
Species	Pres**	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov		
Acer rubrum	0.142857	0.014286	0.666667	8	0.25	3	0.166667	1	0.571429	3.035714	0.333333	3.083333	0.4	2.4	0.166667	0.083333		
Acer saccharum	0.142857	0.014286	0	0	0	0	0	0	0.071429	1.285714	0	0	0	0	0	0		
Betula lenta	0.285714	0.114286	0.333333	0.166667	0.75	0.75	0.166667	0.083333	0.357129	1.428571	0.5	1.166667	0.4	0.2	0.333333	0.166667		
Betula papyrifera	0	0	0	0	0	0	0	0	0.214286	0.107143	0	0	0.6	8.9	0.333333	3.083333		
Betula sp.	0.285714	0.114286	0	0.25	0	0	0	1.166667	0.142857	0.071429	0	0	0.2	0.1	0.5	3.166667		
Carya sp.	0	0	0	0	0	0	0.333333	0.166667	0	0	0	0	0	0	0.166667	1		
Castanea dentata	0.142857	0.014286	0	0	0	0	0.333333	1.083333	0.071429	1.285714	0	0	0.4	2.4	0.166667	3		
Fagus grandifolia	0	0	0	0	0	0	0	0	0.071429	0.035714	0.166667	1	0	0	0	0		
Fraxinus americana	0	0	0	0	0	0	0	0	0	0	0.166667	3	0.2	0.1	0	0		
Hamamelis virginiana	0	0	0	0	0	0	0	0	0.214286	1.75	0	0	0.4	2.4	0.166667	0.083333		

Totals for the plant communities

Species number	1.714286	113.5	1.25	1.25	2.928571	11.94	1287.5	12.59		
Species diversity	0.857143	50.57143	0.666667	1.5	0.768	5.105	637.5	4.33		
Total plant cover	0.116894	0.437258	0.161616	0.392941	0.27618	0.427534	0.510679	0.343927		

Overstory species with ≥ 5% cover in at least one community

Acer rubrum	0.714286	48.57143	0.3	17.83333	1	56.75	0.3	21	0.714286	40	0.333333	16.83333	1	63	0.833333	52.5		
Betula lenta	0.857143	16	0.333333	47.16667	0.25	1.5	0.666667	19.5	0.714286	32.35714	1	55.5	0.8	13.6	0.5	12.33333		
Betula papyrifera	0.857143	13.14286	0.666667	3.083333	0.5	1.625	1	51.33333	0.642857	6.892857	1	30.5	0.4	7.7	0.333333	9.333333		
Betula sp.	0.857143	3.714286	0.3	1.166667	0.5	0.25	0.833333	11.41667	0.785714	2.821429	0.833333	10.08333	0.8	1.5	0.666667	1.25		
Carya sp.	0.142857	0.014286	0.666667	3	0.5	3	0.333333	2	0.285714	8	0.166667	3	0.2	7.6	0.333333	4		
Castanea dentata	0.142857	0.014286	0	0	0	0	0.166667	1	0.071429	0.428571	0	0	0	0	0	0		
Fagus grandifolia	0.142857	0.014286	0.666667	3	0	0	0.166667	1	0.142857	0.464286	0	0	0	0	0.166667	3		
Fraxinus americana	0.285714	0.114286	0.666667	0.083333	0.25	1	0.666667	0.083333	0.285714	0.114286	0	0	0	0	0.166667	0.083333		

TABLE 7 *Short version of presence and cover for other native plant communities (2)*

	c13 Oak-Meli sub n=12		c15 Oak-Holo dis-Symp alb-Poly gly n=9		c10 Oak (Fd)-Holo dis-Symp alb-Rhyt tri n=5		c8 Oak-Symp alb-Rosa nut-Loni cil s.c. n=11		c9 Oak-Symp alb-Rosa nut-Oeml cer s.c. n=10	
Plant species*	Pres**	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov
Montpar	0.0833333	0.0416667	0.1111111	0.0555556	0.2	0.1	0	0	0	0
Arrapra	0.0833333	0.0416667	0.3333333	1.3888889	0	0	0	0	0.1	0.6
Anthodo	0.25	3.0416667	0.3333333	4.3333333	0.6	2.5	0.1818182	1.6818182	0	0
Montper	**0.75**	**3.6666667**	0.4444444	2.0555556	0.4	11.2	0.1818182	1.6818182	0.2	1.2
Polygly	0	0	**1**	**35.222222**	0.4	1.3	0.2727273	1.7272727	0	0
Rhyttri	0.3333333	5	0.1111111	4.2222222	**1**	**23.6**	0.1818182	5.0909091	0.2	6.9
Bromcar	0.0666667	4.1666667	0.5555556	5.3888889	**0.8**	**2.6**	0.5454545	1.2727273	0.5	1.9
Hyngla	**1**	**5.7083333**	**1**	**6.1111111**	**0.8**	**1.5**	**0.8181818**	**4.5**	0.4	1.3
Galapa	**1**	**9.5416667**	**0.7777778**	**6.1111111**	**1**	**6.2**	**0.8181818**	**5.0909091**	0.6	3.05
SympalbB2	0.5	8.8333333	**0.6666667**	**11.555556**	**1**	**18.7**	**1**	**33.909091**	**1**	**42.8**
Dicrsco	0.25	1.5	**0.7777778**	**7.3333333**	0.4	2.4	0.0909091	0.5454545	0	0
Lotumic	0	0	0.1111111	0.0555556	0	0	0	0	0	0
Rhaccan	0	0	0.6666667	10.222222	0.2	0.1	0	0	0	0
Festidah	0.3333333	1.5416667	0.3333333	1.3888889	0	0	0	0	0	0
Festbro	0.5833333	2.6666667	0.5555556	1.5	0.4	1.3	0.0909091	0.0454545	0	0
Lonhis	0.3333333	5	0.2222222	1.3333333	0.4	2.1	0.4545455	10.090909	0	0
Seduspa	0.0833333	0.5	0.3333333	0.1666667	0.2	0.1	0.0909091	0.0454545	0	0

* Species are designated by the first 4 letters of the genus followed by the first 3 letters of the species.

** Mean presence and average cover for shrubs, herbs, and moss layer species with a presence ≥ 0.7% in at least one community.

bold Species used in naming.

Species with < 0.2% presence cover.

TABLE 7 *Short version of presence and cover for other native plant communities (2)*

	c13 Oak-Mel sub n=12		c15 Oak-Holo dis-Symp alb-Poly gly n=9		c10 Oak (Fd)-Holo dis-Symp alb-Rhyt tri n=5		c8 Oak-Symp alb-Rosa nut-Loni cil s.c. n=11		c9 Oak-Symp alb-Rosa nut-Oeml cer s.c. n=10	
Plant species*	Pres**	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov
Abiealpat	0.0833333	0.0416667	0.1111111	0.0555556	0.2	0.1	0	0	0	0
Acerpse	0.0833333	0.0416667	0.3333333	1.3888889	0	0	0	0	0.1	0.6
Anthodo	0.25	3.0416667	0.3333333	1.3333333	0.6	2.2	0.1818182	1.6818182	0	0
Shrubsel	**0.75**	**3.6666667**	0.4444444	2.0555556	0.4	11.2	0.1818182	1.6818182	0.2	1.2
Polygly	0	0	**1**	**35.222222**	0.4	1.4	0.2727273	1.7272727	0	0
Rhytric	0.4166667	5	0.1111111	1.2222222	**1**	**23.6**	0.1818182	5.0909091	0.2	6.9
Rubiacan	0.0833333	1.1666667	0.5555556	3.8888889	**0.8**	2.6	0.5454545	1.2727273	0.3	1.9
Clevpla	**1**	**5.7083333**	**1**	**6.1111111**	**0.8**	**1.5**	**0.8181818**	**4.5**	0.4	1.3
Galapra	**1**	**9.5416667**	**0.7777778**	**6.1111111**	**1**	**6.2**	**0.8181818**	**5.0909091**	0.6	3.05
Sympalb	0.5	8.8333333	**0.6666667**	**11.555556**	**1**	**18.7**	**1**	**33.909091**	**1**	**42.8**
Pteraqu	0.25	1.5	**0.7777778**	**7.3333333**	0.4	1.4	0.0909091	0.5454545	0	0
Lotumic	0	0	0.1111111	0.0555556	0	0	0	0	0	0
Rhacrob	0	0	0.6666667	10.222222	0.2	0.1	0	0	0	0
Fesdalas	0.0833333	1.1666667	0.3333333	1.3888889	0	0	0	0	0	0
Cratdou	0.0833333	2.0666667	0.5555556	1.5	0.4	1.5	0.0909091	0.0454545	0	0
Tsuhet	0.1666667	5	0.2222222	1.4444444	0.4	1.4	0.4545455	10.090909	0	0
Vaculep	0.0833333	0.5	0.3333333	0.1666667	0.2	0.1	0.0909091	0.0454545	0	0

* Species are designated by the first 4 letters of the genus followed by the first 4 letters of the species.

** Mean presence and average cover for shrubs, herbs, and moss layer species with a presence of 0.5 or in at least one community.

Species used to name 2.

Species with 5% or greater cover.

TABLE 7 *Continued*

	c13 Oak-Meli sub n=12		c15 Oak-Holo dis-Symp alb-Poly gly n=9		c10 Oak-(Fd)-Holo dis-Symp alb-Rhyt tri n=5		c8 Oak-Symp alb-Rosa nut-Loni cil s.c. n=11		c9 Oak-Symp alb-Rosa nut-Oeml cer s.c. n=10	
Plant species*	Pres**	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov
Selawal	0	0	0.1111111	0.6666667	0	0	0	0	0	0
Luzumul	0.3333333	0.1666667	0.1111111	0.0555556	0.2	1.2	0.0909091	0.0454545	0	0
Polyjun	0.0833333	0.5	0.4444444	6.2222222	0.2	0.1	0	0	0	0
Collpar	0.25	0.125	0.1111111	0.0555556	0	0	0.0909091	0.0454545	0	0
Crepis	0	0	0	0	0	0	0	0	0	0
Eriolan	0	0	0	0	0	0	0	0	0	0
Pitytri	0.0833333	0.0416667	0	0	0	0	0	0	0	0
Achimil	0.25	0.125	0.4444444	0.8333333	0.4	0.2	0.3636364	0.6818182	0	0
Rumeace	0.25	0.125	0.5555556	0.2777778	0	0	0.1818182	0.0909091	0	0
Ceraarv	0.4166667	0.6666667	0.1111111	0.0555556	0.2	0.1	0.2727273	0.1363636	0	0
Samera	**1**	**10.625**	0.2222222	0.7222222	**1**	**6**	0.4545455	2.2272727	0.4	1.3
Bromste	0.5833333	7.25	0.3333333	0.7777778	0.4	2.4	0.2727273	0.6363636	0.4	1.3
Cynoech	0.1666667	2	0.2222222	0.1111111	0	0	0.1818182	0.0909091	0.1	0.05
MahoaquB2	0.5	2.5416667	0.3333333	1.3333333	**0.8**	**2.6**	0.6363636	3.9090909	0.5	4.85
Vicisat	**0.75**	**6.125**	0	0	0.4	0.2	**0.7272727**	**2.8636364**	0.3	1.25
Vicihir	0.6666667	4.5416667	0	0	0.6	3.8	0.4545455	1.2272727	0	0
Poa pra	**0.9166667**	**7.875**	0.6666667	0.3333333	0.6	3.8	**0.9090909**	**4.5454545**	0.6	3.7
Hyporad	0.3333333	0.1666667	0.5555556	0.8888889	0.2	0.1	0.3636364	0.1818182	0.3	0.15
Tritolg	0	0	0	0	0	0	0	0	0	0
Trifmcc	0.1666667	0.5416667	0	0	0.2	1.2	0	0	0	0
Atracar	0.1666667	0.0833333	0.3333333	0.7777778	0.2	0.1	0	0	0	0
Caremo	0.4166667	2.5833333	0.3333333	0.7777778	**1**	**2.7**	0.0909091	0.5454545	0.1	0.05
Camalet	0.5	2.625	**0.8888889**	**13.333333**	0.6	11.3	0.6363636	4.5	0.5	3.65

TABLE 7 *Continued*

Plant species*	c13 Oak-Meli sub n=12 Pres**	Av cov	c15 Oak-Holo dis-Symp alb-Poly gly n=9 Pres	Av cov	c10 Oak-(Fd)-Holo dis-Symp alb-Rhyt tri n=5 Pres	Av cov	c8 Oak-Symp alb-Rosa nut-Loni cil s.c. n=11 Pres	Av cov	c9 Oak-Symp alb-Rosa nut-Oeml cer s.c. n=10 Pres	Av cov
Viciasme	0.25	1.0416667	0.1111111	0.6666667	**0.8**	**1.5**	0.3636364	1.6818182	0.1	0.05
Dactglo	0.5	3.625	0.4444444	6.0555556	**0.8**	**1.5**	**0.8181818**	**10.772727**	**0.8**	**5.55**
Plantlan	0.5	1.1666667	0.1111111	0.0555556	0.2	0.1	0.4545455	0.2272727	0.1	0.6
Lathnev	0.25	0.5833333	0.3333333	0.7777778	0.4	2.4	0.2727273	4.5454545	0.3	1.25
Ranuocc	0.4166667	1.125	0.1111111	0.0555556	0	0	0.1818182	0.0909091	0.1	1.8
Dantcal	0.25	0.125	0	0	0	0	0	0	0	0
Melsub	**1**	**34.25**	0.2222222	0.7222222	0.4	3.7	0.5454545	3.9545455	0.2	0.65
HolodisB2	0.25	2.5	**0.7777778**	**7.7222222**	**0.6**	**7.3**	0.4545455	5.7272727	0.2	2.4
HolodisB1	0.4333333	6.75	**0.2222222**	**11.222222**	**1**	**54**	0.5454545	15.363636	0.5	8.6
CytiscoB2	0.5833333	5.5833333	**0.7777778**	**6.7222222**	**0.8**	**2.6**	0.4545455	2.2272727	0.2	0.1
Arenmac	0.25	1.5833333	0.1111111	0.0555556	**1**	0.5	0.1818182	0.5909091	0.1	0.05
Stelmed	0.5833333	2.125	0.5555556	1.5	**0.8**	**1.5**	0.0909091	0.5454545	0.2	0.65
Erytore	0.25	0.125	0.4444444	1.4444444	**0.8**	**5**	0.2727273	0.6363636	0.4	1.85
Fritlan	0.1666667	0.5416667	0.1111111	0.0555556	**0.8**	**0.4**	0.2727273	0.6363636	0	0
LoniciB1	0	0	0.1111111	0.0555556	0	0	**0.727272**	**5.545455**	0	0
LoniciI	0.1666667	0.5416667	0.1111111	0.6666667	0.4	0.2	**1**	**18.36364**	0	0
RosanutB1	0	0	0	0	0	0	**0.363636**	**8.3636364**	**0.5**	**11.8**
Rossanut	0.0833333	0.5	0.3333333	1.3888889	0.2	1.2	**0.818181**	**20.54455**	**0.9**	**22.45**
Oemlcer	0	0	0.1111111	0.0555556	0	0	0.3636364	2.2727273	**0.9**	**10.55**
OemlcerB2	0	0	0.2222222	0.7222222	0.2	3.6	0.2727273	0.1363636	**0.6**	**10.5**
Daphlau	0	0	0.2222222	0.7222222	0.4	1.3	0.4545455	5.1363636	**0.8**	**2.7**

TABLE 7 *Continued*

Plant species*	c13 Oak-Meli sub n=12 Pres**	Av cov	c15 Oak-Holo dis-Symp alb-Poly gly n=9 Pres	Av cov	c10 Oak-(Fd)-Holo dis-Symp alb-Rhyt tri n=3 Pres	Av cov	c8 Oak-Symp alb-Rosa nut-Loni cil s.c. n=11 Pres	Av cov	c9 Oak-Symp alb-Rosa nut-Oeml cer s.c. n=10 Pres	Av cov
Vicsepa	0.25	1.0416667	0.1111111	0.0666667	**0.8**	**1.5**	0.3636364	1.6818182	0.1	0.05
Eucglo	0.5	3.625	0.4444444	0.0555556	**0.8**	**1.5**	**0.8181818**	**10.772727**	**0.8**	**5.55**
Plamin	0.5	1.0666667	0.1111111	0.0555556	0.2	0.1	0.4545455	0.2272727	0.1	0.6
Datmey	0.25	0.5833333	0.3333333	0.2777778	0.4	2.1	0.2727273	4.5454545	0.3	1.25
Ranmin	0.75	1.1666667	0.1111111	0.0555556	0	0	0.1818182	0.0909091	0.1	1.8
Daucar	0.25	0.125	0	0	0	0	0	0	0	0
Slehyd	**1**	**34.25**	0.2222222	0.7222222	0.4	7	0.5454545	3.9545455	0.2	0.65
Holodis02	0.5	2.5	**0.7777778**	**7.7222222**	**0.6**	**7.3**	0.4545455	5.7272727	0.2	2.4
Holohi001	0.75	6.75	**0.2222222**	**11.222222**	**1**	**34**	0.5454545	15.363636	0.3	8.6
Cratom02	0.75	3.5833333	**0.7777778**	**6.7222222**	**0.8**	**2.6**	0.4545455	2.2272727	0.2	0.1
Ulmmon	0.5	1.5833333	0.1111111	0.0555556	**1**	**0.5**	0.1818182	0.5909091	0.1	0.05
Slehead	0.75	2.1666667	0.5555556	1.5	**0.8**	**1.5**	0.0909091	0.5454545	0.2	0.65
Eryfor	0.5	0.4166667	0.4444444	1.4444444	**0.8**	**3**	0.2727273	0.6363636	0.4	1.85
Fraful	0.75	0.5416667	0.1111111	0.0555556	**0.8**	**0.4**	0.2727273	0.6363636	0	0
EonicdB1	0.5	0	0.1111111	0.0555556	0	0	**0.727272**	**5.5454545**	0	0
Eonicd	0.75	0.5416667	0.1111111	0.0666667	0.4	0.2	**1**	**18.363636**	0	0
Rosnut01	0	0	0	0	0	0	**0.363636**	**8.3636364**	**0.5**	**13.8**
Arcsanm	0.75	0.5	0.3333333	1.3888889	0.2	2	**0.8181818**	**20.545455**	**0.9**	**22.45**
Oemlcer	0	0	0.1111111	0.0555556	0	0	0.3636364	2.2727273	**0.9**	**18.55**
Oemlcer02	0	0	0.2222222	0.7222222	0.2	0.6	0.2727273	0.1363636	**0.6**	**10.5**
Diphlan	0	0	0.2222222	0.7222222	0.4	1.3	0.1818182	0.1363636	**0.8**	**2.7**

TABLE 7 *Concluded*

Plant species*	c13 Oak-Meli sub n=12 Pres**	Av cov	c15 Oak-Holo dis-Symp alb-Poly gly n=9 Pres	Av cov	c10 Oak-(Fd)-Holo dis-Symp alb-Rhyt tri n=5 Pres	Av cov	c8 Oak-Symp alb-Rosa nut-Loni cil s.c. n=11 Pres	Av cov	c9 Oak-Symp alb-Rosa nut-Oeml cer s.c. n=10 Pres	Av cov
Totals for the plant communities										
Total cover		2350		1744.5		1275.5		2672		2324.5
Dominant cover		933.5		862.5		691		1259.5		1163.5
Dom/tot cover		0.397234		0.494411		0.5417483		0.4713698		0.5005378
Tree layer species with ≥ 0.70 in at least one community										
QuergarA	**0.75**	**40.166667**	**0.6666667**	**29.222222**	**1**	**45**	**1**	**58.454545**	**0.8**	**53.4**
QuergarB1	**0.8333333**	**30.666667**	**0.8888889**	**31.888889**	**1**	**23.8**	**0.9090909**	**22.181818**	**0.7**	**21.2**
QuergarB2	**0.75**	**15.041667**	**0.7777778**	**15.166667**	**0.8**	**10.1**	**0.9090909**	**10.545455**	**0.6**	**3.15**
QuergarD	**0.75**	**2.2916667**	**0.8888889**	**1.0555556**	**1**	**0.5**	**0.6363636**	**0.8181818**	**0.3**	**0.15**
PseumenA	0.5	18.583333	0.3333333	5.5555556	**0.8**	**9.6**	0.3636364	6.1818182	0	0
PseumenB1	0.25	2.5	0.1111111	0.6666667	**0.2**	**1.2**	0.2727273	2.2272727	0.1	0.6
PseumenB2	0.1666667	1	0	0	0	0	0.0909091	0.5454545	0	0
PseumenD	0.25	0.125	0.1111111	0.0555556	0.2	0.1	0.2727273	0.1363636	0	0

Totals for the plant communities

TABLE 7 *Concluded*

Plant species*	c13 Oak- Meli sub n=12 Pres**	Av cov	c15 Oak- Holo dis- Symp alb- Poly gly n=9 Pres	Av cov	c10 Oak-(Fd)- Holo dis- Symp alb- Rhyt tri n=5 Pres	Av cov	c8 Oak- Symp alb- Rosa nut- Loni cil s.c. n=11 Pres	Av cov	c9 Oak- Symp alb- Rosa nut- Oeml cer s.c. n=10 Pres	Av cov
Totals for the plant communities										
Total cover		2350		1744.5		1275.5		2672		2324.5
Dominant cover		933.5		862.5		691		1259.5		1163.5
Dom/tot cover		0.397234		0.494411		0.5417483		0.4713698		0.5005378
Tree layer species with ≥0.70 in at least one community										
QuergarA	0.75	40.166667	0.6666667	29.222222	1	45	1	58.454545	0.8	53.4
QuergarB1	0.8333333	30.666667	0.8888889	31.888889	1	23.8	0.9090909	22.181818	0.7	21.2
QuergarB2	0.75	15.041667	0.7777778	15.166667	0.8	10.1	0.9090909	10.545455	0.6	3.15
QuergarD	0.75	2.2916667	0.8888889	1.0555556	1	0.5	0.6363636	0.8181818	0.3	0.15
PseumenA	0	18.583333	0.3333333	5555556	0.8	9.6	0.3636364	6.1818182	0	0
PseumenB1	0.25	2.5	0.1111111	0.6666667	0.2	1.2	0.2727273	2.2272727	0.1	0.6
PseumenB2	0.1666667	1	0	0	0	0	0.0909091	0.5454545	0	0
PseumenD	0.25	0.125	0.1111111	0.0555556	0.2	0.1	0.2727273	0.1363636	0	0

Totals for the plant communities

TABLE 8 *Short version of presence and cover for second order disturbance (broom) communities*

	c2 Oak-broom-Cyno ech late s. n=6		c3 Oak-broom-Rhac can-Fest bro aira s.c. n=10		c17 Oak-broom-Rhac can: typic s.c. n=3		c22 Oak-broom-Rhac can-Brom tec s.c. n=4		c31b Oak-broom-Anth odo n=3		c4 Oak-broom-Poa pra n=5		c5 Oak-broom-Dact glo n=5		c6 Oak-broom-Elym gla n=6	
Plant species*	Pres**	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov
Alnacar	**0.833**	**3.167**	**0.7**	**4.3**	0.33333	2	0	0	0	0	0.2	0.1	0	0	0.16667	0.08333
Cynoech	**1**	**32.17**	**0.7**	**6.3**	0.33333	12.6667	0.25	1.5	0	0	0.6	1.4	0	0	0.66667	2.16667
Festbro	**1**	**19.75**	**1**	**30.5**	0	0	**0.75**	**4.5**	**0.667**	**6.167**	0.6	6	0.4	1.3	**1**	**14.42**
CytiscoB1	**0.5**	**4.083**	**0.1**	**3.8**	**0.333**	**0.167**	**0**	**0**	**0.333**	**6**	**1**	**15**	**0.6**	**21.4**	**0.333**	**4**
CytiscoB2	**1**	**63**	**0.9**	**38.2**	**1**	**14**	**1**	**37.5**	**1**	**54.67**	**1**	**53**	**1**	**28.2**	**1**	**42.67**
Bromste	**0.833**	**6.083**	**0.9**	**7.5**	**0.667**	**2.167**	**1**	**20**	**0.667**	**6.167**	0.6	10	0.4	4.8	**0.833**	**13.42**
Elymgla	**0.833**	**3.167**	**0.8**	**5.45**	**0.667**	**8**	**0.75**	**3.125**	**1**	**2.333**	**1**	**6**	0.6	2.5	**1**	**21.33**
Galiapa	**0.833**	**9.167**	**0.7**	**2.65**	**1**	**2.333**	**0.75**	**4.75**	**0.667**	**6.167**	**0.8**	**4.8**	**1**	**10.8**	**0.833**	**4.25**
Sanicra	**0.833**	**7.167**	0.3	1.9	0.33333	0.16667	**0.25**	**1.5**	**1**	**8.167**	**1**	**7.3**	**1**	**9.7**	**0.833**	**2.25**
Atrapra	0.16667	0.08333	**0.9**	**7.25**	**1**	**8.167**	**0.75**	**7.5**	**0.667**	**2.167**	0.4	0.2	0	0	0.33333	1.08333
Brommol	0.66667	3.08333	**0.7**	**4.85**	**0.667**	**4**	**1**	**14.25**	**0.667**	**6.167**	**0.8**	**3.7**	0.4	0.2	0.5	1.16667
Rhaccan	0.66667	11.3333	**0.9**	**28**	**1**	**46.33**	**1**	**43.75**	**0.667**	**8**	0.2	1.2	0	0	0.16667	1
Rumeace	0.5	0.16667	**1**	**1.6**	**1**	**2.333**	0.5	3	0.33333	0.16667	**0.8**	**2.6**	0.4	0.2	0.16667	0.08333
Polyjun	0	0	0.5	3	**0.667**	**4**	0.5	3	0.33333	2	0	0	0	0	0	0
Selawal	0.33333	0.16667	0.5	0.25	**1**	**4.167**	0.5	0.25	0.33333	0.16667	0	0	0.2	0.1	0.33333	0.16667
Lotumic	0.66667	0.33333	0.2	0.1	**0.667**	**8**	**0.75**	**3.125**	0	0	0.2	0.1	0	0	0	0
Brodcor	0.5	1.16667	0.6	4.35	**1**	**2.333**	**0.75**	**1.75**	0.33333	2	0	0	0	0	0.5	1.16667
Bromtec	0.16667	3	0.3	1.25	**0.667**	**8**	**1**	**23**	0	0	0	0	0	0	0	0

* Species are designated by the first 4 letters of the genus followed by the first 4 letters of the species.

** Mean presence and average cover for shrubs, herbs, and moss layer species with a presence ≥ 0.70 in at least one community.

bold Species used in naming.

bold Species with ≥ 0.70 presence cover.

	c1		c3		c17		c22		c3Hy		c4		c5		c6	
	Oak-broom		Oak-broom		Oak-broom		Oak-broom		Oak-broom		Oak-broom		Oak-broom		Oak broom	
	Rhac-ulex		Rhac-ulex		Rhac can		Rhac can		Oak		Oak-broom		Oak-broom		Oak broom	
	Cant-ulex		Fest bro		Rhac can		Brom tec		broom		Oak-broom		Dact glo		Hyme gla	
	Isol-ulex		Arrh-ulex		typic s.c.				Anth-ulex		Poa pra		Dact glo		Hyme gla	
	n=6		n=10		n=3		n=4		n=3		n=5		n=3		n=6	
Plant species	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov
	0.833	1.167	0.7	4.3	0.33333	2	0	0	0	0	0.2	0.4	0	0	0.16667	0.08333
	1	2.17	0.7	6.3	0.33333	1.1666	0.25	1.5	0	0	0.6	1.4	0	0	0.66667	2.1666
	1	19.75	1	30.5	0	0	0.75	4.5	0.667	6.167	0.6	6	0.4	1.3	1	14.42
	0.5	1.083	0.1	3.8	0.333	0.167	0	0	0.333	6	1	19.4	0.6	21.4	0.333	4
	1	63	0.9	38.2	1	11	1	37.5	1	54.67	1	53	1	21.2	1	42.67
	0.833	6.083	0.9	7.5	0.667	2.167	1	20	0.667	6.167	0.6	10	0.4	4.8	0.833	13.42
	0.833	3.167	0.8	5.45	0.667	8	0.75	3.125	1	2.333	1	6.2	0.6	2.5	1	21.33
	0.833	9.167	0.7	2.65	1	2.333	0.75	4.75	0.667	6.167	0.8	4.8	1	10.8	0.833	4.25
	0.833	7.167	0.4	1.9	0.33333	0.1666	0.25	1.5	1	8.167	1	7.3	1	9.7	0.833	2.25
			0.9	7.25	1	8.167	0.75	7.5	0.667	2.167	0.4	0.2	0	0	0.33333	1.0833
			0.7	4.85	0.667	4	1	14.25	0.667	6.167	0.8	3.7	0.4	0.2	0.5	1.1666
			0.9	28	1	46.33	1	43.75	0.667	8	0.2	1.2	0	0	0.16667	1
			1	1.6	1	2.333	0.5	1	0.33333	0.1666	0.8	2.6	0.4	0.2	0.16667	0.0833
			0		0.667	4	0.5	1	0.33333	2	0	0	0	0	0	0
			0.4	0.25	1	4.167	0.5	0.25	0.33333	0.1666	0	0	0.2	0.1	0.33333	0.1666
			0.2	0.5	0.667	8	0.75	3.125	0	0	0.2	0.1	0	0	0	0
			0.9	1.35	1	2.333	0.75	1.75	0.33333	2	0	0	0	0	0.5	1.1666
			0.7	1.25	0.667	8	1	23	0	0	0	0	0	0	0	0

TABLE 8 *Continued*

	c2 Oak broom-Cyno ech late s. n=6		c3 Oak-broom-Rhac can-Fest bro-aira s.c. n=10		c17 Oak-broom-Rhac can-typic s.c. n=3		c22 Oak-broom-Rhac can-Brom tec s.c. n=4		c31b Oak-broom Anth odo n=3		c4 Oak-broom-Poa pra n=5		c5 Oak-broom-Dact glo n=5		c6 Oak-broom-Elym gla n=6	
Plant species*	Pres**	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov
MahoaquB2	0.33333	1.08333	0	0	**0.667**	**2.167**	**0.75**	**1.75**	0.66667	12	0.6	2.5	0.2	1.2	0.5	0.25
Euzumul	0.33333	0.16667	0.1	0.6	**0.667**	**0.333**	0	0	**1**	**0.5**	0.2	0.1	0.2	0.1	0	0
Anthodo	0.16667	0.08333	0.2	1.2	**0.667**	**6.167**	0.5	0.25	**1**	**38**	0.6	7.3	0.4	2.4	0.33333	6
Collpar	0.33333	0.16667	0.3	0.15	**0.667**	**2.167**	0.5	0.25	**0.667**	**0.333**	0.2	0.1	0	0	0.16667	0.08333
Camalei	0.66667	1.16667	0.6	3.7	**0.667**	**8**	0.5	1.625	0.33333	6	**0.8**	**6.1**	0.4	3.7	0.66667	8
Stelmed	0.16667	3	0.4	0.2	**0.667**	**2.167**	0.25	0.125	**0.667**	**0.333**	**0.8**	**2.6**	0.6	7.3	0.5	0.25
Veroser	0.16667	0.08333	0.3	0.15	**0.667**	**0.333**	0.5	0.25	**0.667**	**0.333**	**0.8**	**0.4**	0	0	0.5	0.25
SympalbB2	0.16667	0.08333	0	0	**0.667**	**4**	0.5	1.625	**0.667**	**18.67**	**0.8**	**5**	0.4	13.8	0.66667	7.08333
Vicisat	0.5	2.08333	0.5	2.55	**0.667**	**4**	**0.75**	**9.125**	**1**	**0.5**	**1**	**1.6**	**1**	**8.6**	**1**	**4.333**
Trittri	0	0	0.2	0.1	0.33333	2	**0.75**	**4.75**	0	0	0	0	0	0	0	0
Myosdis	0.5	0.25	0.4	0.2	0	0	0.25	1.5	**0.667**	**0.333**	0.4	0.2	0.4	0.2	0	0
Hyporad	0.5	0.25	0.4	0.2	0.33333	2	0.5	0.25	**0.667**	**0.333**	0.2	0.1	0.4	0.2	0.33333	0.16667
Daphlau	0.16667	0.08333	0	0	0	0	0	0	**0.667**	**0.333**	0	0	0.4	0.2	0.16667	0.08333
Pleccon	0	0	0	0	0	0	0.25	0.125	**0.667**	**4**	0.2	0.1	0	0	0.16667	0.08333
Rhyttri	0.16667	10.5	0	0	0	0	0.25	1.5	**1**	**6**	0.4	8.8	0.2	1.2	0.16667	1
Dodehen	0.5	2.08333	0.2	0.1	0	0	0	0	**0.667**	**2.167**	0.4	1.3	0.4	3.7	0.33333	0.16667
Lonihis	0.16667	1	0	0	0.33333	2	0.5	1.625	**0.667**	**6.167**	0.2	1.2	0.2	0.1	0.16667	3
Galiapa2	0	0	0	0	0.33333	2	0	0	**0.667**	**0.333**	0.2	1.2	0.2	0.1	0.16667	3
Teesnud	0.33333	0.16667	0.1	0.05	0	0	0	0	**0.667**	**2.167**	0	0	0	0	0	0
Stelnit	0.16667	0.08333	0.2	0.1	0	0	0	0	**0.667**	**0.333**	0.2	0.1	0	0	0	0
Melsub	0.5	1.08333	0.1	0.6	0	0	0	0	**0.667**	**2.167**	0.2	3.6	0.4	4.8	0.5	4.08333
Geramol	0.5	1.08333	0.5	0.8	0.33333	0.16667	0.5	1.625	**0.667**	**2.167**	**0.8**	**0.4**	0.6	4.9	0.5	4.08333
Eurhore	0.16667	1	0.1	1.8	0	0	0.5	3	**0.667**	**8**	**0.8**	**13.6**	0.6	12.4	0.16667	1
Bromcar	0.5	1.16667	0.3	1.8	0.33333	2	0.25	0.125	**1**	**2.333**	**0.8**	**3.7**	**1**	**9.7**	**0.833**	**2.25**
Dactglo	0.33333	1.08333	0.2	0.65	0	0	0	0	**0.667**	**2.167**	**0.8**	**5**	**1**	**53**	0.5	4.08333

TABLE 8 *Continued*

	c2 Oak-broom-Cyno echlate s. n=6		c3 Oak-broom-Rhac can-Fest broaira s.c. n=10		c17 Oak-broom-Rhac can: typic s.c. n=3		c22 Oak-broom-Rhac can-Brom tec s.c. n=4		c31b Oak-broom-Anth odo n=3		c4 Oak-broom-Poa pra n=5		c5 Oak-broom-Dact glo n=5		c6 Oak-broom-Elym gla n=6	
Plant species*	Pres**	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov
Poa pra	0.33333	3.08333	0.6	1.95	0	0	0.5	6	**1**	**4.167**	**1**	**3.4**	**1**	**9.7**	0.5	3
Montper	0.5	1.16667	0.2	1.85	0.33333	0.16667	0.5	1.625	**1**	**0.5**	**0.8**	**2.6**	**0.8**	**3.7**	0.66667	0.33333
Planlan	0	0	0.1	0.05	0	0	0	0	**0.667**	**2.167**	0.6	0.3	**0.8**	**3.9**	0	0
Vicihir	0.66667	0.16667	0.4	0.2	0.33333	2	0.5	1.625	**0.667**	**0.333**	0.6	0.3	**0.8**	**12**	0.66667	11.3333
Osmochi	0.16667	1	0	0	0	0	0	0	0	0	0.2	0.1	**1**	**10.8**	0.16667	1
Nemopar	0.16667	0.08333	0.1	0.05	0.33333	0.16667	0	0	0	0	0.6	2.5	**0.8**	**1.5**	0.5	0.25
Polymun	0.33333	0.16667	0	0	0	0	0	0	0	0	0	0	**0.8**	**1.5**	0	0
Totals for the plant communities																
Total cover		1488		1878		606		936.5		817		**1212**		1377		1228.5
Dominant cover		886.5		1404		430		715.5		676		861		887.5		653.5
Dom/tot cover		0.59577		0.7476		0.70957		0.76401		0.82742		**0.7104**		**0.64452**		0.53195
Tree layer species with ≥ 0.70 in at least one community																
QuergarA	0.667	30.33	0.5	18.8	0	0	0.5	25.25	0.333	21	0.4	2	1	7.2	0.667	24.17
QuergarB1	0.833	33.33	0.7	21.9	1	27.33	0.75	15.5	1	35.67	0.8	2	0.4	8.4	1	34.67
QuergarB2	0.667	6	0.7	7.9	1	8.167	1	7.625	0.667	12	0.8	4	0.6	2.6	1	13.33
QuergarD	0.333	0.167	1	2.8	0.667	4	1	1.875	1	2.333	0.8	1	0.6	0	1	4.333
PseumenA	0.16667	6.33333	0	0	0	0	0.25	4.5	0.33333	2	0.4	4.8	0.6	6	0.16667	3
PseumenB1	0.16667	1	0	0	0	0	0	0	0	0	0.2	1.2	0	0	0.16667	1
PseumenB2	0.16667	0.08333	0.1	0.05	0	0	0	0	0	0	0	0	0.2	1.2	0	0
PseumenD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TABLE 8. *Continued*

	c2 Oak-broom-Cyno ech-late s.c. n=6		c3 Oak-broom-Rhac can-Fest bro-ata s.c. n=10		c17 Oak-broom-Rhac can-typic s.c. n=3		c22 Oak-broom-Rhac can-Brom tec s.c. n=4		c31b Oak-broom-Anth odo n=3		c4 Oak-broom-Poa pra n=5		c5 Oak-broom-Dact glo n=5		c6 Oak-broom-Elym gla n=6	
Plant species*	Pres*	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov
Poa pra	0.33333	0.08333	0.6	1.95	0	0	0.5	6	1	4.167	1	34	1	9.7	0.5	3
Vicsep	0.5	0.1666*	0.2	1.85	0.33333	0.1666	0.5	1.625	1	0.5	0.8	2.6	0.8	3.7	0.66667	0.33333
Planlan	0	0	0.1	0.05	0	0	0	0	0.667	2.167	0.6	0.3	0.8	3.9	0	0
Vicfab	0.16667	0.1666*	0.3	0.2	0.33333	2	0.5	1.625	0.667	0.333	0.6	0.3	0.8	12	0.66667	11.3333
Osmoch	0.16667	1	0	0	0	0	0	0	0	0	0.2	0.1	1	10.8	0.16667	1
Scmopa	0.16667	0.08333	0.1	0.05	0.33333	0.1666	0	0	0	0	0.6	2.5	0.8	1.5	0.5	0.25
Polvulg	0.33333	0.1666*	0	0	0	0	0	0	0	0	0	0	0.8	1.5	0	0
Totals for the plant communities																
Total cover		1.88		18.78		606		936.3		817		1212		1377		1228.3
Dominant cover		80.3		1304		130		731.5		676		861		887.5		653.5
Dom/tot cover		0.39577		0.7476		0.70957		0.76401		0.82742		0.7104		0.64452		0.53193
Tree layer species with >0.70 in at least one community																
QuergarA	0.667	30.33	0.5	18.8	0	0	0.5	25.25	0.333	21	0.4	2	1	73	0.667	24.17
QuergarB1	0.833	33.33	0.7	21.9	1	27.33	0.75	15.5	1	35.67	0.8	2	0.4	8.8	1	34.67
QuergarB2	0.667	6	0.7	7.9	1	8.167	1	7.625	0.667	12	0.8	6	0.6	2.5	1	13.33
QuergarD	0.333	0.167	1	2.8	0.667	4	1	1.875	1	2.333	0.8	5	0.6	0.3	1	4.333
PsemenA	0.1666*	0.33333	0	0	0	0	0.25	4.5	0.3333	2	0.4	4.8	0.6	6	0.16667	3
PsemenB1	0.1666*	1	0	0	0	0	0	0	0	0	0.2	1.2	0	0	0.16667	1
PsemenB2	0.1666*	0.08333	0.1	0.05	0	0	0	0	0	0	0	0	0.2	1.2	0	0
PsemenD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TABLE 9 *Short version of presence and cover for first order disturbance (non-broom) communities*

	c30 Oak-Rhac can-Fest bro s.c. n=3		c21 Oak-Cyno ech late s. n=9		c23 Oak-Brom ste n=9		c31a Oak-Anth odo n=7		c29a Oak-Poa pra-Vici sat n=14		c28b Oak-Dact glo-Brom car s.c. n=5		c28a Oak-Dact glo: typic n=16		c30 Oak-Dact glo-Arrh ela s.c. n=5		c49 Oak-Dact glo-Agro sto s.c. n=5	
Plant species*	Pres**	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov
Claramo	**0.6666667**	**0.3333333**	0	0	0	0	0	0	0	0	0	**0**	0	0	0	**0**	0	0
Achimil	**0.6666667**	**2.1666667**	0.3333333	1.3888889	0.5555556	1.5	0.42857	2.714286	0.35714	0.57143	0.4	**1.3**	0.25	0.46875	0	**0**	**0.2**	1.2
Brommol	**0.6666667**	**8**	0.4444444	2.7777778	0.5555556	4.0555556	0.42857	1	0.64286	1.89286	0.6	**1.4**	0.4375	0.90625	0.3333333	**2**	0	0
Rumeace	**0.6666667**	**0.3333333**	0.5555556	5.3888889	0.2222222	0.1111111	0.28571	2.642857	0.28571	0.92857	0.2	**1.2**	0.3125	0.84375	0	**0**	0.2	1.2
Airapra	**1**	**4.1666667**	0.1111111	0.6666667	0.1111111	0.6666667	0.42857	1	0.14286	0.07143	0	**0**	0.125	0.0625	0	**0**	0.2	0.1
Brodcor	**0.6666667**	**0.3333333**	0.4444444	2.0555556	0.3333333	0.7777778	0.57143	6.857143	0.35714	3.64286	0	**0**	0.3125	0.5	0.1666667	**3**	0.4	4.8
Luzumul	**0.6666667**	**0.3333333**	0	0	0.1111111	0.6666667	0.28571	0.142857	0.28571	0.14286	0	**0**	0.25	0.125	0	**0**	0.4	1.3
Careino	**0.6666667**	**8**	0.3333333	8.2222222	0	0	0.42857	3.5	0.21429	2.60714	0	**0**	0.4375	4.34375	0	**0**	0	0
Lonihis	**1**	**8.1666667**	0.2222222	2.0555556	0.3333333	3.3333333	0.42857	8.071429	0.35714	0.96429	0.2	**3.6**	0.3125	2.34375	0	**0**	0	0
Triftri	**0.6666667**	**2.1666667**	0.1111111	0.0555556	0	0	0	0	0	0	0	**0**	0	0	0	**0**	0	0
Polyjun	**0.6666667**	**8**	0.1111111	0.6666667	0	0	0.28571	1.714286	0	0	0	**0**	0.125	0.75	0	**0**	0	0
Ceraarv	**0.6666667**	**4**	**0.6666667**	**2.7777778**	0.3333333	0.7777778	0.28571	5.142857	0.5	3.46429	0.2	**1.2**	0.4375	1.25	0.1666667	**1**	0	0
Lotumic	**1**	**10**	**0.7777778**	**6.8333333**	0.1111111	0.0555556	0	0	0.42857	2.25	0	**0**	0.125	0.40625	0	**0**	0.2	0.1
Cynoech	**0.6666667**	**8**	**1**	**57.444444**	0.3333333	2.7222222	0.28571	0.142857	0.35714	4.32143	0.2	**1.2**	0.375	1.21875	0	**0**	0	0
Rhaccan	**1**	**48**	**0.8888889**	**12.444444**	0.2222222	1.3333333	0.57143	5.142857	0	0	0	**0**	0.125	0.75	0.1666667	**1**	0	0
Trifmcc	**0.6666667**	**4**	**0.6666667**	**11.222222**	0.1111111	0.6666667	0.14286	0.857143	0.35714	2.21429	0	**0**	0.0625	0.03125	0	**0**	0	0
Festbro	**1**	**35.666667**	0.3333333	4.0555556	**0.7777778**	**9.5555556**	0.57143	1.857143	**0.71429**	**2.32143**	0.6	**4.9**	0.4375	3.09375	0.3333333	**4**	0.2	0.1
Hyporad	**1**	**0.5**	0.3333333	0.1666667	0.4444444	0.8333333	0.57143	1.071429	**0.71429**	**1.14286**	**0.8**	**2.6**	0.4375	0.5625	0.5	**0.25**	0.2	0.1

* Species are designated by the first 4 letters of the genus followed by the first 3 letters of the species.

** Mean presence and average cover for shrubs, herbs, and moss layer species with a presence ≥ 0.70 in at least one community.

Species used in naming.

Species with ≥ 0.70 presence cover.

TABLE 9 *Continued*

	c30 Oak-Rhac can Fest bro s.c. n=3		c21 Oak-Cyno ech late s. n=9		c23 Oak-Brom ste n=9		c31a Oak-Anth odo n=7		c29a Oak-Poa pra-Vici sat n=14		c28b Oak-Dact glo-Brom car s.c. n=5		c28a Oak-Dact glo: typic n=16		c30 Oak-Dact glo-Arrh ela s.c. n=5		c49 Oak-Dact glo-Agro sto s.c. n=5	
Plant species*	Pres**	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov
Elymgla	**1**	**8.1666667**	**0.8888889**	**6.7777778**	**0.7777778**	**4.1666667**	**0.71429**	**5.214286**	**0.92857**	**6.57143**	**0.8**	**8.5**	**0.8125**	**7.1875**	0	**0**	0.4	3.7
Bromcar	**1**	**2.3333333**	0.2222222	0.1111111	**0.6666667**	**4.1111111**	0.42857	1	**0.85714**	**3.64286**	**1**	**18**	**0.75**	**4.21875**	0.6666667	7.0833333	0.4	1.3
Bromste	**0.6666667**	**0.3333333**	**0.8888889**	**8.8888889**	**1**	**41.333333**	0.42857	2.714286	**0.92857**	**5.96429**	0.6	2.5	0.5625	4.1875	**0.8333333**	**5.1666667**	0.4	1.3
Vicihir	**0.6666667**	**0.3333333**	0.2222222	0.7222222	**0.8888889**	**8.7222222**	0.57143	1.857143	**0.85714**	**11.5714**	**1**	**9.7**	**0.75**	**4.84375**	**0.8333333**	**11.416667**	0.6	6
Poa pra	**0.6666667**	**2.1666667**	**0.8888889**	**10.055556**	0.4444444	6.2222222	**1**	**18.35714**	**1**	**28.0714**	**1**	**30**	0.6875	15.8438	**1**	**15.083333**	0.6	3.6
Saniera	**1**	**6.3333333**	0.4444444	2.0555556	**0.7777778**	**8.0555556**	**0.71429**	**3.642857**	**0.92857**	**9.92857**	**0.8**	**2.6**	**0.875**	**6.125**	**0.8333333**	**5.1666667**	0.6	2.5
Vicisat	**0.6666667**	**0.3333333**	0.5555556	8.9444444	**1**	**13.833333**	**0.71429**	**5.357143**	**0.92857**	**15.2857**	**0.8**	**9.6**	**0.8125**	**7.9375**	**1**	**13.083333**	**0.8**	**6.1**
Galiapa	0.3333333	0.1666667	0.6666667	6.1666667	**0.8888889**	**9.8333333**	**0.71429**	**3.642857**	**0.85714**	**4.89286**	**0.8**	**7.2**	**0.9375**	**9.59375**	**1**	**2.3333333**	0.6	11.3
Planlan	0.3333333	0.1666667	0.2222222	0.7222222	0.1111111	0.6666667	**0.71429**	**3.642857**	0.35714	0.96429	0.6	4.9	0.5	0.9375	0.5	**3.1666667**	0.6	1.4
Ranuocc	0	0	0.2222222	0.1111111	0.3333333	6.2777778	**0.71429**	**1.142857**	0.21429	0.10714	0.2	1.2	0.375	1.21875	0.1666667	1	0.2	0.1
Anthodo	0.3333333	2	0.3333333	4.9444444	0.3333333	2.7222222	**1**	**49.42857**	0.28571	3.89286	0.4	4.8	0.5	7.8125	0.1666667	3	0.6	2.5
Dantcal	0.3333333	2	0.4444444	5.3333333	0.1111111	0.0555556	**0.85714**	**5.285714**	0.07143	0.42857	0	0	0.1875	0.4375	0	**0**	0.2	0.1
Trifdub	0.3333333	0.1666667	0.4444444	2.0555556	0.4444444	4.7222222	**0.71429**	**5.214286**	0.5	2.60714	0.6	1.4	0.1875	0.4375	0.5	**1.1666667**	0	0
Sympalb82	0.3333333	0.1666667	0.2222222	0.7222222	0.5555556	8.9444444	**0.71429**	**7.714286**	0.64286	16.1071	0.4	8.8	**0.75**	**11.75**	0.5	12.333333	0.6	1.4
Dactglo	0	0	0.2222222	0.1111111	0.3333333	4.0555556	**0.71429**	**6.142857**	0.42857	3.42857	**1**	**5**	**1**	**35.8125**	**1**	**0.666667**	**0.8**	**29**
Geramol	0	0	0.6666667	8.2777778	0.3333333	2.7222222	0.28571	0.142857	**0.85714**	**12.5**	0.6	0.3	**0.75**	**5.03125**	**0.8333333**	**5.1666667**	0.6	2.5
Camalei	0.3333333	0.1666667	0	0	0.4444444	2.6666667	0.57143	12.57143	0.42857	12	**0.8**	**7.4**	0.5625	7.28125	0.5	8.3333333	0.4	4.8
Arrhela	0	0	0	0	0	0	0	0	0.07143	1.28571	0	**0**	0	0	**1**	**5**	0.2	1.2
Agrosto	0	0	0	0	0	0	0.14286	0.071429	0	0	0.2	1.2	0.0625	0.03125	0	**0**	**1**	**30**
Taraoff	0	0	0	0	0.1111111	0.0555556	0.28571	0.928571	0.28571	0.53571	0.4	1.3	0.4375	0.5625	0.5	**1.1666667**	**0.8**	**1.5**

TABLE 2 *Continued*

	c20 Oak- Rhac cath Lest bro s.c. n=3		c21 Oak- Cyno ech-late s. n=9		c23 Oak- Brom ste n=9		c31a Oak- Anth odo n=7		c29a Oak- Poa pra Vici sat n=14		c28b Oak- Dact glo- Brom car s.c. n=5		c28a Oak- Dact glo- Hypic n=16		c30 Oak- Dact glo- Arrh ela s.c. n=5		c49 Oak- Dact glo- Agro sto s.c. n=5	
Anthropleurs*	Pres**	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov
Elengla	1	8.1666667	**0.8888889**	**6.7777778**	**0.7777778**	**4.1666667**	**0.71429**	**5.214286**	**0.92857**	**6.57143**	**0.8**	**8.5**	**0.8125**	**7.1875**	0	0	0.4	3.7
Anthsan	1	2.3333333	0.2222222	0.1111111	**0.6666667**	**4.1111111**	0.42857	1	0.85714	3.64286	**1**	**18**	0.75	4.21875	0.6666667	7.0833333	0.4	1.3
Brom ste	0.6666667	0.3333333	**0.8888889**	**8.8888889**	**1**	**41.333333**	0.42857	2.714286	**0.92857**	**5.96429**	0.6	2.5	0.5625	4.1875	**0.8333333**	**3.1666667**	0.4	1.3
Cirsfla	0.6666667	0.3333333	0.2222222	0.1222222	**0.8888889**	**8.7222222**	0.57143	1.857143	**0.85714**	**11.5714**	**1**	**9.7**	0.75	4.84375	**0.8333333**	**11.416667**	0.6	6
Dactglo	0.6666667	2.1666667	**0.8888889**	**10.055556**	0.4444444	6.2222222	**1**	**18.35714**	**1**	**28.0714**	**1**	**30**	0.6875	15.8438	**1**	**15.083333**	0.6	3.6
Galsch	1	6.3333333	0.4444444	2.0555556	**0.7777778**	**8.0555556**	**0.71429**	**3.642857**	**0.92857**	**9.92857**	**0.8**	**2.6**	**0.875**	**6.125**	**0.8333333**	**5.1666667**	0.6	2.5
Vicisat	0.6666667	0.3333333	0.5555556	8.9444444	**1**	**13.833333**	**0.71429**	**5.357143**	**0.92857**	**15.2857**	**0.8**	**9.6**	**0.8125**	**7.9375**	**1**	**13.083333**	**0.8**	**6.1**
Galapa	0.3333333	0.1666667	0.6666667	6.1666667	**0.8888889**	**9.8333333**	**0.71429**	**3.642857**	**0.85714**	**4.89286**	**0.8**	**7.2**	**0.9375**	**9.59375**	**1**	**2.3333333**	0.6	11.3
Planlan	0.3333333	0.1666667	0.2222222	0.1222222	0.1111111	0.6666667	**0.71429**	**3.642857**	0.35714	0.96429	0.6	4.9	0.5	0.9375	0.5	**3.1666667**	0.6	1.4
Ranmoc	0	0	0.2222222	0.1111111	0.3333333	6.2777778	**0.71429**	**1.142857**	0.21429	0.10714	0.2	1.2	0.375	1.21875	0.1666667	1	0.2	0.1
Anthodo	0.3333333	2	0.3333333	1.0444444	0.3333333	2.7222222	**1**	**49.42857**	0.28571	3.89286	0.4	4.8	0.5	7.8125	0.1666667	3	0.6	2.3
Dactcal	0.3333333	2	0.4444444	6.3333333	0.1111111	0.0555556	**0.85714**	**5.285714**	0.07143	0.42857	0	0	0.1875	0.1375	0	0	0.2	0.1
Dauhis	0.3333333	0.1666667	0.4444444	2.0555556	0.4444444	1.7222222	**0.71429**	**5.214286**	0.5	2.60714	0.6	1.4	0.1875	0.1375	0.5	1.1666667	0	0
Sympalbi	0.3333333	0.1666667	0.2222222	0.1222222	0.5555556	8.9444444	**0.71429**	**7.714286**	0.64286	16.1429	0.4	8.8	**0.75**	**11.75**	0.5	12.333333	0.6	1.4
Dactglo	0	0	0.2222222	0.1111111	0.3333333	4.0555556	**0.71429**	**6.142857**	0.42857	3.42857	**1**	**48**	**1**	**35.8125**	**1**	**0.666667**	**0.8**	**29**
Ostatlon	0	0	0.6666667	8.2777778	0.3333333	2.7222222	0.28571	0.142857	**0.85714**	**12.5**	0.6	0.3	**0.75**	**5.03125**	**0.8333333**	**3.1666667**	0.6	2.3
Camaler	0.3333333	0.1666667	0	0	0.4444444	2.6666667	0.57143	12.57143	0.42857	12	**0.8**	**7.4**	0.5625	7.28125	0.5	8.3333333	0.4	4.8
Arrhela	0	0	0	0	0	0	0	0	0.07143	1.28571	0	0	0	0	**1**	**35.5**	0.2	1.2
Agrosto	0	0	0	0	0	0	0.14286	0.071429	0	0	0.2	1.2	0.0625	0.03125	0	0	**1**	**30**
Taraoff	0	0	0	0	0.1111111	0.0555556	0.28571	0.928571	0.28571	0.57143	0.4	1.3	0.1875	0.3625	0.5	1.1666667	**0.8**	**1.5**

TABLE 9 *Continued*

	c30 Oak Rhac cat Fest bro s.c. n=3		c21 Oak- Cyno ech late s. n=9		c23 Oak- Brom ste n=9		c31a Oak- Anth odo n=7		c29a Oak- Poa pra- Vici sat n=14		c28b Oak- Dact glo- Brom car s.c. n=5		c28a Oak- Dact glo: typic n=16		c30 Oak- Dact glo- Arrh ela s.c. n=5		c49 Oak- Dact glo- Agro sto s.c. n=5	
Plant species*	Pres**	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov
Totals for the plant communities																		
Total cover		582		1912		1924		1649		3075		1124.5		3278		1267.5		971
Dominant cover		523		922		859.5		803.5		1426.5		718		1480		657.5		333
Dom/tot cov		0.8986254		0.4822176		0.4467256		0.487263		0.4639		0.638506		0.45149		0.5187377		0.3429454
Tree layer species with > 0.70 in at least one community																		
QuergarA	0.6666667	18.666667	1	60.222222	0.6666667	30.888889	0.85714	49.42857	0.71429	46.7857	1	0.9	0.9	51.5625	1	0.5	0.8	50.4
QuergarB1	0.6666667	27	0.4444444	5.3333333	0.7777778	38.444444	0.85714	18.07143	0.71429	22.7143	1	1.24	0.8	19.8125	0.3333333	0.3333333	0.4	20.2
QuergarB2	1	8.1666667	0.7777778	1.6111111	0.7777778	7.7222222	0.57143	6.071429	0.64286	2.28571	0.8	0.9	0.6	3.875	0.5	0.0833333	0.6	1.4
QuergarD	0.6666667	4	0.3333333	0.1666667	0.6666667	4.7222222	0.42857	1.785714	0.78571	1.64286	0.6	1.4	0.62	1.6875	0.5	0.25	0.4	1.5
PseumenA	0.6666667	8	0.3333333	6.8888889	0	0	0.28571	3.428571	0.21429	3	0	0	0.25	3	0	0	0	0
PseumenB1	0.3333333	2	0.1111111	0.6666667	0	0	0.28571	1.714286	0.07143	0.42857	0.2	7.6	0.125	0.75	0	0	0	0
PseumenB2	0.3333333	6	0	0	0.1111111	2	0.14286	0.857143	0	0	0.2	0.1	0	0	0	0	0	0
PseumenD	0.3333333	0.1666667	0.1111111	0.0555556	0	0	0	0	0	0	0.4	0.2	0	0	0	0	0	0

TABLE 6. Continued.

	c30 Oak- Alnus cord. Lest hist s.c. n=3		c21 Oak- Cyno c.-h late s. n=9		c23 Oak- Brom ste n=9		c31a Oak- Anth odo n=7		c29a Oak- Poa pra- Vici sat n=11		c28b Oak- Dact glo- Brom car s.c. n=3		c28a Oak- Dact glo- typic n=16		c30 Oak- Dact glo- Arrh ela s.c. n=5		c49 Oak- Dact glo- Agro sto s.c. n=5	
Plant species*	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov	Pres	Av cov
Total species per plot (mean values)																		
Total cover			1412		1024		1040		30		11213		3278		1263		91	
Dominant cover			922		839.5		803.5		142.5		718		1480		653		333	
Dom/Tot cov	0.86231		0.4822176		0.8196289		0.48.265		0.4739		0.638506		0.45149		0.5187377		0.3421134	
Tree layer species with IV > 0.30 in at least one community																		
QuergarA	0.666666	18.666667	1	60.222222	0.6666667	30.888889	0.85714	49.42857	0.71429	46.7857	1	63	0.93	51.5625	1	50.5	0.8	50.4
QuergarB1	0.666666	27	0.4444444	5.3333333	0.7777778	38.444444	0.85714	18.07143	0.71429	22.7143	1	12.4	0.87	19.8125	0.3333333	6.3333333	0.4	20.2
QuergarB2	1	8.1666667	0.7777778	1.6111111	0.7777778	7.7222222	0.57143	6.071429	0.64286	2.28571	0.8	6.1	0.62	3.875	0.5	1.0833333	0.6	1.4
QuergarD	0.666666	4	0.3333333	0.1666667	0.6666667	4.7222222	0.42857	1.785714	0.78571	1.64286	0.6	1.4	0.62	1.6875	0.5	0.25	0.8	1.5
UsenmenA			0.3333333	0.5888889	0	0	0.28571	3.42857	0.21429	3	0	0	0.25	3	0	0	0	0
UsenmenB1			0.1111111	0.0666667	0	0	0.28571	1.71286	0.07143	0.42857	0.2	7.6	0.125	0.75	0	0	0	0
UsenmenB2			0	0	0.1111111	2	0.14286	0.85714	0	0	0.2	0.1	0	0	0	0	0	0
UsenmenD			0.1111111	0.0333336	0	0	0	0	0	0	0.1	0.2	0	0	0	0	0	0

Constant Cover Value Index The Constant Cover Value Index gives the proportion of the cover of the constant species in relation to the total cover for each plant community. This test is important for checking whether the classification has accounted for a sufficient amount of total cover. Results are shown in Table 4 and outlined for each plant community in the ecosystem descriptions in Chapters 5 and 6 of the thesis (Erickson 1996).

TABLE 10 *Constant cover value index results*

Community	Value	Number of plots
c2	0.60	6
c3	0.75	10
c4	0.71	5
c5	0.64	5
c6	0.53	6
c8	0.47	11
c9	0.50	10
c10	0.54	5
c11	0.58	7
c13	0.40	12
c14	0.34	6
c15	0.49	9
c16a	0.38	9
c17	0.71	3
c20	0.41	7
c21	0.48	9
c22	0.76	4
c23	0.45	9
c25	0.44	6
c26	0.50	4
c27	0.62	4
c28a	0.45	16
c28b	0.64	5
c29a	0.46	14
c30	0.52	5
c31a	0.49	7
c31b	0.83	3
c35a	0.42	5
c35b	0.68	4
c36	0.37	50
c37a	0.24	12
c37b	0.34	6
c41	0.51	5
c42	0.39	6
c43	0.43	6
c45	0.34	5
c46	0.51	4
c47	0.27	14
c48	0.40	12
c49	0.34	5
c50	0.89	3
c51	0.83	3
c52	0.50	4

A value of 1.0 would be obtained if the constant species of the community had all of the cover, a suspect situation. Minimum values might be as low as 0.0 for a community from a phytosociological classification using presence classes with lower classification standards. My constant cover value index results range from 0.89 to 0.24. The communities with higher index values have a larger proportion of their total cover contributed by species, which are constant (mean presence ≥ 0.70). In general, the higher the index value, the "better" the grouping. However, the ideal range appeared to be between 0.40 and 0.70, which included 27 of the 43 communities. Seven communities had higher values and nine had lower values. Most of the higher values (> 0.70) are from communities dominated by broom, or found on special habitats such as bedrock outcrops. The high values for the broom types can be considered a "swamping" effect of high broom cover.

Most of the lower values (< 0.40) represent native plant communities (Oak—*Carex inops* (c14), Oak—*Dicranum scoparium—Sedum spathulifolium* (c45), Oak—*Elymus glaucus* (c47), of which several are the early-season herbaceous types (Oak—*Camassia leichtlinii* (c36), Oak—*Camassia quamash*: typic subcommunity (c37a), and Oak—*Camassia quamash—Ranunculus occidentalis* subcommunity (c37b). Keeping these communities in the classification is consistent with my emphasis on native species to meet conservation biology objectives (B.C. Ministry of Forests 1995; see section 1.3 in the thesis). Grouping broom and non-broom plots together led to the low values for the one non-native community, Oak—*Dactylis glomerata—Agrostis stolonifera* (c30). I am maintaining this community to support my reconnaissance observations and allow the moistest of the *Dactylis glomerata* subcommunities to be depicted. No changes were made as a result of the constant cover value index, for the reasons previously discussed.

Adjusted Motyka Coefficient Results The adjusted Motyka coefficient gives a measure of the similarities and differences in the cover of species present in the two plant communities being compared. Results are shown in Table 5 and graphed in comparison with outside values in Figure 23.

A total of 80 comparisons were completed for the 43 plant communities or subcommunities. The higher the value, the more similar the two communities. The values had a wide a range, from 0 (c5 vs. c9) to 1.85 (28a vs. 28b). The values with an asterisk from adjacent units in the plant community tables cover about the same range (0.15–1.85), with no particular concentrations (Table 11). Some of the highest values came from comparisons of subcommunities. The use of the adjusted Motyka coefficient led to a number of changes in the subjective classification. Several communities were reassigned as subcommunities. However, the index was used as a classification aid, rather than as a means of precisely determining the placement of communities. For example, Oak—Broom—*Poa pratensis* (c4) and Oak—Broom—*Elymus glaucus* (c6) had a high similarity (index value: 1.12), but were retained as communities for several reasons. I wanted to differentiate the lesser-disturbed, native *Elymus glaucus* type from the introduced *Poa pratensis* type. The high index value is also thought to represent the "swamping" effect of high broom cover. The Oak—*Bromus sterilis* (c23) and Oak—*Poa pratensis* (c29a) communities had a relatively high degree of similarity (index value 1.0), but were kept separate in recognition of their different environmental relationships. These two communities are also discussed as a benchmark comparison in

TABLE 11 *Adjusted Motyka coefficient results*

1.85 c28a v. c28b*	**1.66** c17 v. c22*	**1.64** c8 v. c9*
1.52 c20 v.c25*	**1.44** c3 v. c50	**1.32** c35a v. c37a
1.12 c4 v. c6	**1.07** c5 v. c28a	**1.04** c42 v. c20
1.02 c3 v. c17*	**1.0** c23 v. c29a	**0.87** c50 v. c46
0.87 c2ɞa v. c49	**0.86** c17 v. c46	**0.80** c51 v. c11
0.79 c28a v. c30*	**0.78** c4 v. c5*	**0.76** c16a v. c20
0.75 c23 v. c16a	**0.74** c31a v. c31b	**0.73** c28a v. c29a
0.71 c51 v. c48	**0.68** c48 v. c36*	**0.66** c13 v. c29a
0.64 c4 v. c29a	**0.62** c37a v. c37b*	**0.61** c35a v. c37b*
0.61 c13 v. c20	**0.60** c52 v. c11*	**0.60** c6 v. c47
0.59 c28a v. c41	**0.59** c37a v. c36	**0.58** c26 v. c20*
0.57 c23 v. c28a	**0.57** c47 v. c14	**0.57** c16a v. c47
0.55 c23 v. c26	**0.55** c47 v. c20	**0.55** c29a v. c31a*
0.53 c2 v. c22	**0.51** c2 v. c21	**0.49** c42 v. c43
0.49 c13 v. c47	**0.48** c28a v. c31a	**0.48** c28b v. c43
0.47 c51 v. c36	**0.46** c26 v. c47	**0.44** c23 v. c22
0.43 c16a v. c26*	**0.42** c45 v. c11	**0.40** c37a v. c35b*
0.39 c28a v. c43	**0.38** c26 v. c21	**0.37** c5 v. c6*
0.36 c23 v. c47	**0.36** c13 v. c31a	**0.33** c15 v. c10*
0.30 c47 v. c28a	**0.29** c20 v. c27	**0.29** c45 v. c51
0.29 c29a v. c14	**0.27** c13 v. c14*	**0.27** c20 v. c43
0.27 c8 v. c10*	**0.25** c51 v. c52	**0.25** c51 v. c52
0.24 c21 v. c46	**0.23** c35a v. c35b	**0.21** c31a v. c14
0.20 c47 v. c43*	**0.19** c23 v. c31a*	**0.19** c20 v. c14
0.19 c48 v. c37a	**0.15** c50 v. c51	**0.15** c23 v. c21*
0.10 c15 v. c8	**0.10** c51 v. c37a	**0.09** c47 v. c21
0.08 c16a v. c21	**0.00** c15 v. c9	

Bold = coefficient values; communities are identified by their alpha-numeric designation.

* = adjacent community pairs from the tables.

Appendix 5. Some existing subcommunities have a lower index value, but their level of classification was maintained because of visually obvious named species and the simplicity of keeping them as subcommunities.

As benchmarks from the adjusted Motyka comparison are useful as reference points for considering the method and the range of values, two comparisons are presented in Appendix 5 as reference points. One of these comparisons is for "equal similarities and differences" (index value of 1.0) and the other is for the "average" comparison (index value of 0.57).

Comparisons of Plant Communities from Other Sources The adjusted Motyka coefficient was used to compare 26 plant communities or other units from oak woodlands, savannah, and grasslands in the Pacific Northwest (Figure 23, Appendix 6). These comparisons provide a means of evaluating the level of differentiation in my classification compared with that of the other studies. The values from adjacent communities in my data (0.15–1.85) fall partly within the range (0.31–2.98) from the outside data sources (Figure 23). My study had an average comparison value (0.57) close to the median value (0.64 or 0.54) from the outside comparisons, and had index values representing a degree of differentiation most similar to other oak woodland studies. These results place my study in a context of scientific classification work. On the other hand, a few of my communities were more similar to each other

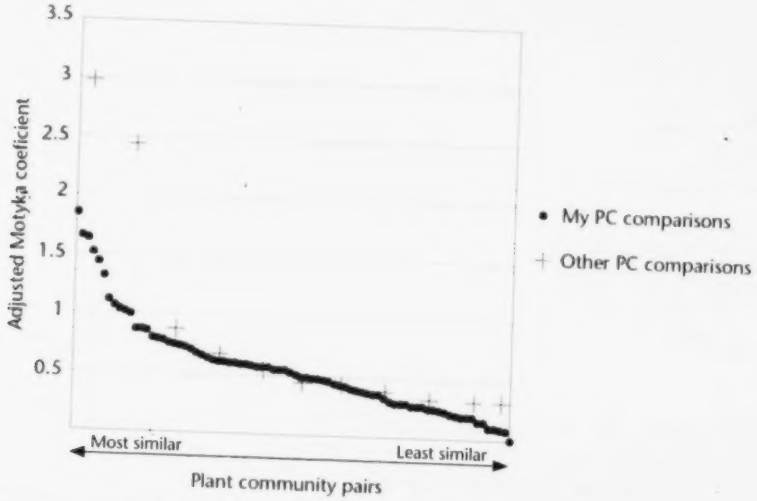


FIGURE 23 *Adjusted Motyka coefficient results, including other studies. Gradient of comparison results for plant community pairs, arranged from most similar (high values) to least.*

(high index value) than are the other oak woodland communities to each other. This degree of similarity does not, however, approach that suggested for the biogeoclimatic ecosystem classification (BEC) system of the B.C. Ministry of Forests in which community pairs are much more similar to each other (four values of 2.44 to 22.1). Nevertheless, two BEC units (see Appendix 6 on CD) had a degree of differentiation (0.43, 0.54) closer to my communities.

In summary, my level of differentiation was similar to that of other studies in the Pacific Northwest. This similarity represents a relatively consistent level of classification, both within my classification and within the larger group of studies in general. The exception is the minute level of differentiation in some of the examples from the BEC classification, a result which may be attributed to an emphasis on presence, rather than cover.

Multiple Regression Results A series of exploratory multiple regression analyses was completed on the 1993 data using SPSS for WINDOWS (Version 6.0). The purpose was to examine the relationships between the plant communities and environmental variables by determining which of the following account for the variation in the plant community gradient (the dependent variable): surface rocks, surface shape, aspect, elevation, bedrock and humus over bedrock, slope, and ecological moisture regime (the independent variables). Ecological moisture regime was also run as a dependent variable with the remaining six environmental variables. The sample domain was restricted to the actual confines of the plots sampled.

A general multiple regression is employed to determine whether there is a relationship between all the independent variables taken together (the predictors) and the dependent variable (criterion) based on the proportion of variance accounted for. The "adjusted R-square" is the statistic used for interpretation of this proportion because it gives the reliable result reflecting shrinkage from the R-square to remove positive bias, to compensate for smaller sample sizes, and for lower subject-to-variable ratios. In a general multiple regression (using default settings), the adjusted R-square for all the predictors was 0.407, or 41% of the variation in the plant community

gradient. Little shrinkage (< 0.04) occurred in the adjusted R-square because the subject-to-variable ratio was kept higher (18:1) than the level at which shrinkage becomes a concern (10:1). "Beta" or standardized beta weights are used to interpret which variables have the highest relative value in the prediction equation, with all other variables taken into account. The full equation is not of interest here because the "raw scores" ("beta") form is only used to reinterpret individual test results. Moisture regime had the highest Beta weight: −0.54 with all other predictors taken into account. The only other predictor with a Beta weight above .1 (positive or negative) was elevation: −.23 with all the other predictors taken into account. The standardized formula showing these Beta results is:

$$\hat{y} = .540103 \times F + .236909 \times B + .099341 \times E + .060171 \times H + .041312 \times D + .007835 \times G + -.049472 \times C + .074105 \text{ (error)};$$

where: F = moisture regime, B = elevation, E = surface shape, H = rocks, D = aspect, G = bedrock and humus over bedrock, and C = slope.

Correlation methods are used, interpreted with R-square values, to determine which variable is the most important by itself in accounting for variation in the criterion. A Pearson-product moment correlation examined the individual relationships between and among the predictors and the plant community gradient. Moisture regime had the highest correlation with the gradient, with an R-square of 0.37, representing 37% of the variation. Percent bedrock and humus over bedrock accounted for 15.2% of variation; surface shape and percent slope accounted for 13.8% each, followed by aspect, elevation, and percent surface rocks, with 6%, 7.6%, and 3.5%. The correlation also examined the small contribution in the general multiple regression by seemingly important predictors. Moisture regime is a composite variable, which includes the influence of all the other variables, as well as many others not included or not measured.

The following were correlated strongly (collinear) with moisture regime: percent surface bedrock and humus over bedrock, 42.2% of variation; surface shape, 32.9% of variation; and percent slope, 27% of variation. Less correlated were aspect, 5.6%; elevation, 5%; and percent rock cover, 2.4%. In a general multiple regression with ecological moisture regime as the dependent variable, the six other environmental variables resulted in a very high adjusted R-square of 0.58, with minimal shrinkage (.019).

Stepwise multiple regression was applied to examine the influence of predictor variables on the plant community gradient taken first separately (step one), then with the previously entered variables taken into account (subsequent steps). In a stepwise multiple regression with all the variables, only two steps were required before no new variation was accounted for (using the SPSS default parameters). With just these two steps, an adjusted R-square of 0.43 was obtained. Shrinkage in the adjusted R-square was very low (<0.009), with the higher subject-to-variable ratio resulting from the use of only two steps. Interpretation of the influence of the variables uses "percentage of variation accounted for," which is derived from the individual R-square values. The prediction equation is not relevant to interpretation. Step 1, moisture regime, accounted for 37% of the variation in the plant community gradient, as in the correlation result. Step 2 was for elevation, which contributed an additional 5.5% of variation.

Moisture regime was excluded in a subsequent stepwise multiple regression to investigate the influence of the other predictors separately. Four variables were entered under the SPSS defaults. Without moisture regime, values were considerably lower, but still substantial, with an adjusted R-square of .316. Shrinkage was low (<0.03) with the high subject-to-variable ratio. Percent bedrock and humus over bedrock account for the most variation: 15.5%. Aspect accounted for 5% of variation; surface shape for 3.1%; and elevation for less than 1%. Percent slope and percent surface rocks were not entered into the regression by the program defaults. At this point the addition of these last two variables was unnecessary, as virtually all of the variation was accounted for.

Regeneration of Oak

Natural regeneration of oak was compared using seedling and sapling designations for all native plant communities and all first- and second-order plant communities (Figure 24). Regeneration is the ability to successfully recruit seedling and shrub layer oaks. Many researchers have expressed concern about lack of oak regeneration (Tunison 1973; Pojar 1980; Gordon et al. 1989; Keeler-Wolf 1990; Hibbs and Yoder 1993; Kavanaugh n.d.). Rossi (1980, p. 8) called "the conspicuous lack of oak regeneration" "perhaps the most important issue in oak management." Three transects had no saplings (< 1 m) in the regeneration study of Corrigan (1991) for the Victoria area.

Competition from introduced plant species, broom, and native shrubs is considered an important factor responsible for this shortcoming (e.g., Sugihara and Reed 1987; Welker and Menke 1990; Kavanaugh 1992, n.d.; Hibbs and Yoder 1993). Therefore, I expected to confirm these relationships with plot data comparisons between native and introduced plant community categories. Contrary to these expectations, there was not much difference in these and other categories, except for:

- a slightly higher percentage of native plant communities with saplings present on all sites and a slightly higher percentage which are well-stocked compared with "disturbed" (first- and second-order) communities
- slightly more plant communities with sapling regeneration on all sites from the other native plant communities compared with the early-season plant communities
- a higher percentage of plant communities with sapling and seedling regeneration present on all sites on the second-order category (broom) communities than the first-order disturbance category, and a higher percentage with moderate to well-stocked saplings
- a higher percentage of plant communities with light stocking for both the sapling and seedling classes on the first-order disturbance category than the second-order disturbance (broom) category
- a slightly higher percentage with saplings present on most sites and seedling regeneration present on all sites for the second-order disturbance categories compared with other native plant communities
- a higher percentage with well-stocked saplings for other native plant communities compared with second-order disturbance communities.

The first-year results of Krannitz and Bennett (1994) for one site on Vancouver Island (Mary Hill) correspond in general to my results. These authors suggested that grass and shrub competition did not affect oak survival. Regeneration results from Corrigan (1991) for the Victoria area exceeded those

	Regeneration							Stocking																
	Saplings			Seedlings				Saplings								Seedlings								
				ABS.	Present			LT	L-M	L-MW	M	MW	M-W	W	VW	NON	V LT	LT	L-M	L-MW	MD	MW	MW-W	W
Grouping	Some	Most	All		Some	Most	All																	
All: #	6	30	7	1	9	24	9	5	3	2	12	13	6	4	1	1	2	23	6	3	2	4	1	1
%	14	70	16	2	21	56	21	12	7	5	28	30	14	9	2	2	5	53	14	7	5	9	2	2
Native: #	5	16	5	1	5	15	5	2	1	2	6	9	4	4	1	1	1	15	3	3	0	1	1	1
%	19	61	19	4	19	58	19	8	4	8	23	35	15	15	4	4	4	58	11	11	0	4	4	4
Disturbed: #	1	14	2	0	4	9	4	3	2	0	6	4	2	0	0	0	1	8	3	0	2	3	0	0
%	6	82	12	0	23	53	23	18	12	0	35	23	12	0	0	0	6	47	18	0	12	18	0	0
Native E: #	1	6	0	1	1	3	2	1	0	2	0	3	1	0	0	1	0	5	0	0	0	1	0	0
%	14	86	0	14	14	43	28	14	0	28	0	43	14	0	0	14	0	71	0	0	0	14	0	0
Native O: #	4	11	5	0	4	12	4	1	1	0	5	5	3	4	1	0	1	11	3	3	0	2	1	0
%	20	55	25	0	20	60	20	5	5	0	40	40	15	20	5	0	5	55	15	15	0	10	5	0
1st Order: #	1	8	0	0	3	6	0	3	2	0	3	3	0	0	0	0	0	5	2	0	0	2	0	0
%	11	89	0	0	33	66	0	33	22	0	33	33	0	0	0	0	0	55	44	0	0	22	0	0
2nd Order: #	0	6	2	0	1	3	4	0	0	0	5	1	2	0	0	0	1	3	1	0	2	1	0	0
%	0	75	25	0	12	37	50	0	0	0	62	12	25	0	0	0	12	37	12	0	25	12	0	0
Native-O: %	20	55	25	0	20	60	20	5	5	0	40	40	15	20	5	0	5	55	15	15	0	10	5	0
2nd Order: %	0	75	25	0	12	37	50	0	0	0	62	12	25	0	0	0	12		12	0	25	12	0	0

FIGURE 24 *Regeneration summary of grouping categories for plant communities.*

Notes: Number (#) or percentage (%) of plant communities within each grouping per category.

ABS. = Absent.

The categories Saplings Absent and Non-stocked were not needed.

The groupings were abbreviated as follows: All= All the plant communities; Native E=Early season native plant communities; Native O=Other native plant communities; Native=both the previous; 1st Order=First-order Disturbance plant communities; 2nd Order=Second-order disturbance communities; Disturbed= both the previous together.

Saplings – low shrub (B2) layer, 0.5 to 2m height; Seedlings – D layer (<0.5m) oaks. All sites: 1.0 constancy, most sites < 1.0 but ≥ 0.70; some sites <0.70.

in the recruitment model of Anderson and Pasquinelli (1984) for *Quercus garryana* in northern California.

My comparisons raise questions regarding the suggested inadequacy of oak regeneration and the role of competition from introduced species and native shrubs. Although this competition is hypothesized to be an ecosystem dynamic, regeneration of oaks in the native plant community category was not better than that in the introduced community category. Similarly, native shrub plant communities apparently did not inhibit regeneration. The comment of Bartolome et al. (1987) may also apply to the study area: overgeneralization of the actual status of oak regeneration is the common thread that binds the concerns expressed.

More detail on a more precise scale for evaluation is provided in the plant community descriptions. When considered community by community, 11 plant communities had regeneration limited in some way (absent or present only on some sites or with stocking below normal). These communities were split about evenly between introduced and native communities and between "xeric" and "mesic," but were predominantly "grassy." Grass competition with oak species has been demonstrated in California, where competition inhibited growth and was thought to lead to decreased seedling survival (Danielsen and Halvorson 1991). Further investigation at an appropriate scale might reveal a similar situation in British Columbia.

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* See footnote, pg. 57

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